ALFONSO OLALLA AND HIS FAMILY: THE ORNITHOLOGICAL EXPLORATION OF AMAZONIAN PERU

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ABSTRACT

In 1922 Frank M. Chapman hired a family of Ecuadorians to collect birds and mammals for the American Museum of Natural History (AMNH). In the following two years, Carlos Olalla and his four sons (especially Alfonso and Ramón) shipped some 3500 carefully prepared and neatly labeled specimens of Ecuadorian birds to New York. In 1925, under a new contract with the AMNH, the Olallas moved their operations to northeastern Peru, and during the next two and a half years, mostly as a result of efforts by Alfonso and Ramón, they sent over 7000 specimens of birds to New York from Amazonian Peru, as well as additional thousands of specimens of mammals. The two brothers shifted their operations to Brazil in 1928. Alfonso went on to ship even larger collections of birds from Brazil to museums in the United States, Sweden, and Brazil. Altogether these collections have provided the documentation for much of what we now know about the distributions of Amazonian birds and mammals.

In 1962 accusations surfaced that the Olallas had falsified much of the information about their specimens. Although based on hearsay, these accusations raised lingering doubts about the Olallas' collections. Alfonso sent reports of the brothers' activities to the AMNH with their shipments of specimens. These reports together with their correspondence with Chapman and other curators are still preserved in the archives of the departments of ornithology and mammalogy. Examination of these archives and of most of the Olallas' specimens of birds and primates from Peru provides a clear view of their activities for the first time.

All of the Olallas' collecting sites in Amazonian Peru can now be confidently located, and a large majority of their specimens from these localities accord with current understanding of avian distributions in Amazonian Peru. The accusations of general carelessness or systematic duplicity can thus be rejected. Nevertheless, there remains a small number of problematic specimens. Especially suspect are those acquired from the Olallas in Iquitos by Harvey Bassler with labels from the mouth of the Río Urubamba. These specimens eventually came to the AMNH as a part of Bassler's collection, rather than directly from the Olallas.

Alfonso and Ramón Olalla's choice of collecting sites suggests that they became aware of the importance of major rivers in limiting avian distributions in Amazonia, and their correspondence with Chapman suggests that their collections brought this insight to the attention of ornithologists in New York. In addition, their collections suggest patterns of avian distribution that still need further investigation, especially the extension of some species of the Andean foothills into the lowlands of upper Amazonia and the less consistent limitations of avian distributions by the upper Río Ucayali in comparison to the Río Amazonas. No doubt some of the Olallas' specimens indicate yet undiscovered features of avian distribution in upper Amazonia, where, despite Alfonso and Ramón's pioneering efforts, there is surely more to learn.

INTRODUCTION

During the 1920s the American Museum of Natural History (AMNH) engaged a family of Ecuadorians, Carlos Olalla and his sons (Alfonso, Ramón, Manuel, and Rosalino), to collect birds and mammals in Ecuador and Peru. As a result, the museum acquired over 10,000 specimens of neatly prepared and labeled specimens of birds and hundreds of specimens of mammals. Many of these specimens were later exchanged with or sold to other museums. Altogether they formed the basis for systematic revisions of many Amazonian birds and primates. In subsequent decades, one of the Olalla brothers went on to collect thousands of additional birds for the AMNH in Brazil. Later, he collected further thousands of specimens for other museums in North America, Europe, and Brazil. As a result, it is possible that members of the Olalla family collected the majority of all specimens of Amazonian birds currently in museums around the world. They certainly did so in the first half of the 20th century.

This entire corpus of work has been cast into shadow by charges of duplicity and carelessness. These accusations arose from a single source in 1962 and were subsequently pursued by a single ornithologist. Attempting to understand what can and what cannot be

trusted in the Olallas' enormous body of work is an important enterprise for Neotropical ornithology and mammalogy. This review focuses on the Olallas' collections from Amazonian Peru in the interval from 1925 to 1928, the period on which the accusations also focus.

After reviewing the accusations and the controversy they engendered, I examine the documentary evidence for the Olallas' itinerary in Peru, their procedures for labeling specimens, and the locations where they worked. This evaluation relies heavily on Alfonso Olalla's manuscript journals in the archives of the AMNH departments of ornithology and mammalogy. In addition, I have examined most of the specimens of birds and primates collected by the Olallas in Peru, including nearly all those in the AMNH but also many in other museums. In the end, there appears to be no compelling reason to doubt the Olallas' collections or localities. Instead, it is difficult not to suspect a dark current of ethnic prejudice underlying the accusations. Nevertheless, in light of our current understanding of avian distributions in Amazonian Peru, a small number of the Olallas' specimens are from surprising locations. Some of these surprises suggest new lines for further research. Also important is the human story of three years' labors in the rainforests of Amazonian Peru by two brothers in continual financial and medical extremities. It is a story of persistent exploration, despite repeated setbacks, and of insightful decisions, despite crossed communications, in one of the most challenging landscapes of the 20th century. It is a story of extraordinary accomplishments.

ACCUSATIONS AGAINST "NATIVE COLLECTORS"

The controversy over the Olallas' collections began with a letter from Professor Pierce Brodkorb at the University of Florida to Eugene Eisenmann at the AMNH on 5 October 1962. Brodkorb had information that "should be on record in the American Museum," namely accusations of fraud by the Olallas. A letter written in 1941 by William Clarke-MacIntyre, a commercial collector in Ecuador, asserted that he had seen the Olallas falsify their labels:

> I know of one important instance in particular [of irregularities by native collectors]— Dr. Chapman of the Am. Museum paid a family of native collectors very handsomely to get together a collection of birds from the lower Putumayo and the Napo rivers.... The collectors only covered about half of their assigned territory but the labels on the specimens showed them collected from a dozen collecting stations that they never visited and in cases where 20 or more specimens were collected in a single day, the dates were "fixed up" to show that the material had been collected over a period of 6 mos.! I not only happened along and saw the collectors, the specimens & the labels, but heard them talk of how easy it was—that it made no real difference—"the gringos would never know anyway! the important thing was to give them a lot of material with diversified labels"—I've often wondered if the "bird-men" of the Am. Mus. ever discovered the hoax that had been worked on them, or if they faithfully based their geographic & seasonal distributions on the data of those labels?

Brodkorb suggested that Eisenmann might want to bring this matter to the attention of Dean Amadon, then chairman of the Department of Ornithology at the AMNH. He believed that MacIntyre was dead but had a relative in New Jersey.

According to Brodkorb's letter, the quotation came from a letter by MacIntyre dated 1 June 1941 to Helen T. Gaige, then curator of herpetology at the University of Michigan Museum of Zoology. Presumably Brodkorb had seen it while at Michigan in the 1940s. Gaige's correspondence is not preserved in the UMMZ, according to a message from Greg Schneider in 2004. Schneider consulted two active curators emeriti, Robert Storer and Reeve Baily, neither of whom had any recollection of this correspondence about the Olallas, although both expressed hesitation in accepting information from commercial collectors at face value.

Brodkorb's papers are stored, although not cataloged, at the Florida Museum of Natural History, where after two searches Tom Webber located a five-page letter dated 16 July 1941 to Brodkorb at the University of Michigan from MacIntyre in Ecuador. In this

letter MacIntyre mentions a previous letter to Gaige "by last mail," but provides no hint of its contents. MacIntyre instead responded to a request from Brodkorb for specimens from Loja, Ecuador. MacIntyre had no plans to visit Loja in the next year and instead tried to interest Brodkorb in specimens from an anticipated expedition to the upper ríos Napo, Putumayo, and Caquetá or, alternatively, in a crate of birds from Loja currently in storage. The letter made two references to the Olallas.

First, he mentioned Chapman's plans for collections from the Putumayo and Caquetá:

> I know that the American Mus. was at one time very anxious to have a large collection of birds (they wanted 'em in series of 20!) from those regions, & I'm pretty sure they haven't gotten them as yet. I know Dr. Chapman sent the Olallas on a trip down the Napo & Amazon, although he asked them to collect the Putumayo & Caquetá, they didn't do except in the mouths of those rivers—but I don't doubt but that they sent material labeled clear up to the head waters of those rivers.

Then, with reference to the birds in storage, he stated,

> Now as to Loja material—I have some on hand, packed up, at Baños—bought it of [sic] one of the Olallas when he returned from a trip he made to get some humming birds for a museum in Paris—don't know, right now, just what I have.

In short, his opinion of the Olallas was not so low that he demurred at purchasing their specimens and reselling them to northern museums!

Before continuing the history of these accusations, I should note that a few points are already clear. Although MacIntyre had heard of the Olallas' expedition to Peru, he obviously knew little about it. The Olallas did not in fact collect on the Putumayo and Caquetá as originally planned but only because Chapman changed the itinerary. The Olallas did not send a single specimen with labels from either of those rivers, contrary to MacIntyre's accusatory assumption.

Furthermore, the Olallas with whom MacIntyre had interacted, presumably in part to purchase the birds from Loja, did not include all the individuals involved in the expedition to Peru and beyond. The father, Carlos, might still have been alive, but the Olalla who collected in southern Ecuador in the late 1930s and 1940s would have been Rosalino or Ramón, who had returned to Ecuador by then. Carlos, as revealed in his correspondence with Chapman during the 1920s, had an argumentative streak and harbored repeated suspicions that the museum underpaid him. Whether this situation ever led him or his family in Quito to shortchange the museum, in retribution, is another story. Whatever we conclude in that case does not apply to the two Olallas in Peru, the brothers Alfonso and Ramón, who in fact took steps to dissociate themselves professionally from the rest of the family in Quito.

Once the accusation of duplicity by the Olallas had reached the AMNH, it took on a new life. Brodkorb's letter to Eisenmann was forwarded to Dean Amadon with an undated note from "COB" (Charles O'Brien, then collection manager) that stated, "I don't believe F.M.C. [Chapman] discovered the fraud but eventually it became evident to J.T.Z. [John Zimmer, associate curator of ornithology at the AMNH] in respect to the Amazonian material." Charles Vaurie, associate and later curator of ornithology at the AMNH, however, was the one who pursued the matter repeatedly. He wrote to Emmet Blake, then curator of birds at the Field Museum in Chicago, for any information he or other curators there might have about the Olallas' specimens. Blake replied on 17 February 1965 with information that Henry Boardman Conover had done business both with Carlos for Ecuadorian gamebirds and with A.M. (Alfonso) Olalla for Brazilian material. Blake's impression was that Carlos was suspect but that Alfonso was "not given to actual skullduggery, although generally he didn't bother to indicate which side of a river his [specimens] came from ... He simply didn't know any better."

Blake went on to say that "[Philip] Hershkovitz ... bears me out on this and has had exactly the same trouble with monkeys borrowed from the AMNH that you are having with some of our Olalla birds.

In fact, Philip [Hershkovitz] admits that in his younger collecting days he also was less than precise in specifying localities as related to the banks of rivers."

Blake also responded to two queries about specimens. The first case involved two subspecies "[*Ortalis motmot*] *motmot* and *ruficeps* on virtually the same dates" at Lago Cuipeva (or Cuitêua), Brazil. "I believe," Blake concluded, "the explanation is clear (carelessness), although the river appears to be damnably broad at that point [on the lower Amazon]." Blake also felt that "the mixup at Pinhel would have the same explanation."

Vaurie's interest in these specimens arose in the course of his revisions of the Cracidae in *American Museum Novitates* (10 issues, 1964–1967), in which he routinely listed the Olallas' specimens from Ecuador and Peru without comment, including those from the subsequently contentious mouth of the Río Urubamba. However, Vaurie did question seven specimens collected by Alfonso Olalla in Brazil after he had left Peru. One, a specimen of *Mitu tuberosum* from the Río Negro (Vaurie, 1967b: 17), is now known to be within the range of this species (Scheuerman, 1977). The other six have labels indicating they were collected on the same date, 10 June 1933, at Lago Cuipeva (Vaurie equates this with Cuipeua) and Pinhel, Brazilian localities north and south of the Amazon respectively. The contentious specimens are two *Ortalis motmot ruficeps* and one *Pipile cujubi* at the first locality, both taxa otherwise known only from south of the Amazon, and three *O. m. ruficeps* at the second locality, on the western side of the Río Tapajós, although this taxon is otherwise known only east of that river (Vaurie, 1965: 16–17, 1968: 209). The chachalacas from Lago Cuipeva and Pinhel are presumably those mentioned in Blake's letter, discussed above. On the other hand, Vaurie's revisions of the Cracidae accepted other specimens obtained by Alfonso Olalla at Lago Cuipeva and twice based substantive decisions on Alfonso's specimens from northern Bolivia reported by Gyldenstolpe (1945b) (Vaurie, 1965: 9, 1967a: 4–5).

On 27 March 1971, Vaurie pursued the matter with a handwritten letter to unspecified friends in which he referred again to Brodkorb's letter. In addition, he claimed to have found irregularities in the Olallas' collections for the Natural History Museum in Stockholm. In Gyldenstope's correspondence, Vaurie claimed to have found a letter with complaints that the Olallas had sold some of their specimens to other buyers, instead of sending everything to Stockholm. "Gyldenstolpe did not enlarge, but the labels of the skins subtracted must certainly be fraudulent," concluded Vaurie. Furthermore, according to Vaurie, "Hershkovitz of Chicago had decided to ignore all the material collected by the Olallas because of too much cheating." Vaurie adds that "the sexing [of specimens] of the Olallas is also too often improbable to trust." He concluded, in a stupendous appeal to prejudice, "no *critical* decisions about systematic status, range, and dates can be based on Olalla material. If it 'fits', well and good, but if anything is doubtful at all—ignore it" (italics for original underlining).

Not everybody was convinced. Paulo E. Vanzolini, director of the Museu de Zoologia da Universidade de São Paulo, wrote to C.W. Myers, curator of herpetology at the AMNH, "I personally trust Olalla's localities. There is the matter of wide apart localities on the same day, but this is because he employed many local collectors. His name on the label actually means the firm, not always the person. As we acquired over the years large collections from him, I took pains to check his field men (in the Tapajós), and found them reliable, apparently even as to on which side of the river the bird was shot" (letter dated 1 September 1972 in the archives of the Department of Ornithology).

In a subsequent interchange with Myers on 11 October 1972, Vaurie reiterated his accusations: "I regret that Dr. Vanzolini doesn't seem to be discriminating." He dismissed Vanzolini's observations: "For instance on the *same* day, males may be labeled from a locality north of the Amazon, and females from another, about 125 miles south of the Amazon, although it is usually not so flagrant" (italics for original underlining). Vaurie also reiterated Gyldenstope's concerns. He added that "coming from Stockholm—I found in the Paris Museum some of these skins that they acquired innocently—

not knowing that the Olallas were under contract with Gyldenstolpe. If they are in Paris, some were probably offered elsewhere." No details were presented, however.

By this time, Vaurie's ornithological gazetteer of Peru had been published as an issue of *American Museum Novitates* (Vaurie, 1972). Vaurie explained that this gazetteer was based on the index of Peruvian localities that John T. Zimmer had prepared during his revisions of Peruvian birds primarily in the 1930s and 1940s. Zimmer had participated in an expedition to Peru for the Field Museum in 1922–1923 and subsequently had published descriptions of new subspecies (Zimmer, 1924a, 1924b, 1927) and a monograph on the birds of the expedition (Zimmer, 1930). In 1930, Chapman hired Zimmer as an associate curator in the Department of Ornithology at the AMNH to prepare a comprehensive study of the birds of Peru along the lines of Chapman's studies of the birds of Colombia and Ecuador. Zimmer arrived in New York two years after the last of the Olallas' shipments from Peru. Chapman no doubt felt that accession of these large collections from Amazonian Peru, combined with the museum's already large holdings from the Andes and the coast, put the AMNH in a unique position to prepare the first overview of the Peruvian avifauna.

Zimmer never produced this overview. Instead, with meticulous care, he proceeded to revise the systematics of the majority of Peruvian birds in a series of 66 papers in *American Museum Novitates*, between 1931 and 1955, and in a few additional papers elsewhere. During this effort he assembled his file of Peruvian localities, usually one 3 × 5 inch card for each locality, eventually totaling over 1000 cards, each of which included alternative names for the locality, the department in which it was located, the names of collectors who had worked there, and the coordinates from a map published in Lima in 1912. This file was in the archives of the Department of Ornithology in 2004–2005, when I examined it. It is now permanently located in the Section of Ornithology at the Louisiana State University Museum of Natural Science (Van Remsen, in litt., 2010).

Vaurie's (1972) gazetteer included the names of localities on Zimmer's cards, each followed by the names of collectors provided by Zimmer, the department, and the coordinates from the American Geographical Society's "Map of Hispanic America," of which the 12 sheets for Peru were published between 1924 and 1939. Vaurie evidently did not use the revisions of several sheets published after 1945. Vaurie also quoted some of Zimmer's comments about a locality and provided some comments of his own.

Vaurie's treatment of the Olallas' localities reflected his conclusions about their authenticity. He included neither Boca Lagarto Cocha nor Boca Río Curaray, presumably because the collectors' labels specified "Ecuador" (a point discussed below). For Puerto Indiana, Orosa, and Apayacu, Vaurie's treatment suggested uncertainty about the exact locations. Vaurie had no reservations about Sarayacu, a locality visited by many Europeans before the Olallas. Vaurie introduced minor mistakes about the locations of Santa Rosa and Lagarto, but for "URUBAMBA, 'boca del Urubamba' (Olallas)," Vaurie provided no location. Instead, he appended the comment, "this is a fraudulent locality, the labels were forged by the collectors named, according to Zimmer." In short, Vaurie had concluded that most of the Olallas' sites could not now be accurately located and that one of them, the mouth of the Urubamba, had been entirely fabricated. As discussed below, Vaurie's conclusions about the Olallas' locations were subsequently adopted with minor modifications by Stephens and Traylor (1983). In particular, they repeated verbatim Vaurie's allegations about "boca del Urubamba" under the heading "URUBAMBA, RIO."

To my knowledge, none of Zimmer's publications expressed any doubt about the Olallas' collections or localities. He included their specimens routinely in his lists of specimens examined, under the Olallas' localities (although Zimmer often substituted "Anayacu" or "Apiyacu" for Apayacu). There is, however, a comment on the back of his index card for "Boca de Urubamba" about a fabricated label:

> Certain skins (of *Philydor erythrocercus subfulvus*) [sic] sold by the Olallas to Harvey Bassler, have this locality [Boca Río Urubamba] on the label but they are fraudulently labeled

> and belong to the fauna of e. Ec. [Ecuador] & Peru north of the Amazon. The label is one not in use by the Olallas at this locality (square base; printed "Peru") (label actually used has basal corners clipped & is printed "Ecuador"; this crossed off & Peru stamped on afterwards); according to our collections this label was not used before Teffé, Brazil. Probably the skins are now collected in eastern Ecuador & mislabeled for sale as Peruvian birds.

In his revisions of *Philydor erythrocercum* and *ruficaudatum*, Zimmer (1935) did not mention a specimen from Boca Río Urubamba, even in the list of specimens examined. Vaurie's comprehensive review of the Furnariidae (Vaurie, 1980) also did not mention this specimen. Otherwise, Zimmer routinely listed the Olallas' specimens from Boca Río Urubamba (translated as "mouth of Río Urubamba"). A specimen of *Philydor erythrocercum subfulvum*, currently in the AMNH with this locality on one of the Olallas' labels, is among a group of six problematic specimens in a collection acquired from Harvey Bassler, to be discussed in a separate section below.

Subsequent students of Peruvian birds have tended to follow Zimmer's practice rather than Vaurie's accusations (as perpetuated by Stephens and Traylor, 1983) but with some lingering doubts. In the following sections, I review the Olallas' itinerary in Peru, describe their labels, review the evidence for their locations, and discuss problematic specimens in their collections.

ALFONSO AND RAMÓN OLALLA IN AMAZONIAN PERU

Chapman Engages the Olallas

During the early ornithological documentation of Andean countries, Colombia was the source of the largest number of specimens (Chapman, 1926). Prior to the American Museum's expeditions early in the century, most specimens of Colombian birds had been obtained by native collectors and exported through Bogotá without other information about localities. In contrast, although Ecuador had also developed a market for native bird collectors, it had also regularly attracted visiting ornithologists to localities throughout the country. Peru had been explored by a number of intrepid ornithologists, but it had never developed native bird collectors.

Chapman's careful work on the zonal distributions of birds in the Andes of Colombia and Ecuador had left him particularly sensitive to the limitations of native collectors (Chapman, 1926: 10–11). As ornithology advanced after the turn of the century, ornithologists could see the importance of carefully documented specimens for distributional analyses. In Ecuador, Ludovic Söderstrom (the Swedish consul-general in Quito in the 1920s) encouraged native collectors to label their specimens with locality and sex. Nevertheless, as Chapman cautioned, each locality was best interpreted as the base of operations for collectors who worked in areas of undetermined extent. He did not doubt the sincerity of the native collectors but only their awareness of the importance of precise information. Native collectors had not been the only ones careless with labels, however, as Chapman (1926: 728) explained in reviewing Clarence Buckley's collections on the ríos Bobonaza and Pastaza near Sarayacu (Ecuador). It was the need for accurate information about bird distributions that motivated Chapman's own expeditions to the Andes.

Chapman's encounter with a family of native collectors in Quito, however, transformed the way the AMNH, and ultimately other museums, could obtain large numbers of specimens with the new requirements for accuracy. His association with the Olallas, and especially with Alfonso Olalla, was a departure from the way major museums had previously acquired ornithological collections. In this venture, he relied on native collectors but insisted on accurate and precise information and careful preparation of specimens, features previously attempted only by trained ornithologists.

Chapmen first met the Olallas in 1922 during his second trip to Ecuador. From 1913 onward (with a hiatus from 1917 to 1919) Chapman and other collectors for the American Museum had worked extensively along the western coast and in the southwestern mountains of Ecuador. In August 1922 during his first visit to Quito, with George Cherrie and Geoffrey O'Connell,

Chapman made a trip to Mindo accompanied by Ramón Olalla, "a member of a family of professional bird collectors." Chapman was impressed with how quickly Ramón learned the American Museum's methods of preparing specimens and the "importance of care in sexing and accuracy in locality labeling" (Chapman, 1926: 16–17). This experience led Chapman to employ Ramón, along with his three brothers (Alfonso, Manuel, and Rosalino) and father (Carlos), to ascend Sumaco, an "almost mythical" mountain east of the Andes.

Chapman (1926: 17) noted that in the following two years the father and four brothers, working under the professional name "Olalla e hijos," delivered a collection of "beautifully prepared" skins illustrating the life zones of this area. The collection contained several new forms, including one new genus. Chapman was nevertheless disappointed that the temperate zone on Sumaco had an avifauna practically the same as that along the main range of the Andes. Perhaps he was hoping for differences comparable to those he had discovered between the main ranges of the Andes in Colombia.

Chapman was particularly impressed with the meticulous records maintained by the Olallas. Supplied with a thermometer and instructions to record temperatures at sunrise and sunset, the Olallas had obtained evidence for a correlation between the avifaunas and the temperatures of the different life zones. Alfonso also provided narratives of the family's itineraries in the form of reports, now in the archives of the AMNH Department of Ornithology. These reports established the pattern for subsequent ones about Alfonso's own expeditions throughout the following decade. Each report was apparently written immediately after the expedition it covered and was usually sent to New York with the shipments of birds and mammals collected.

Because the reliability of the Olallas' records has been questioned, it is worthwhile summarizing these accounts of their activities, as a basis for evaluating their procedures and as a testimony to the daunting challenges they faced in the field.

Expeditions to Sumaco in Eastern Ecuador

As Chapman (1926) wryly observed, "less-seasoned travelers would have made [these reports] the basis of tales of hardship and adventure." For example, on their first expedition to Sumaco, the return to Archidona on foot with their collections required three weeks of travel in the tropical rains (April–May 1923) (see fig. 1). A total of 11 days was spent waiting for three torrential rivers to subside enough to ford. Chapman (1926) notes that the accuracy of Alfonso's reports was confirmed by their agreement with accounts of the British-American explorer George M. Dyot (1926), who ascended Sumaco within two years after the Olallas' visits.

On their second expedition to Sumaco (1923–1924), rising rivers, lack of food, and scarcity of porters combined to make a journey from Quito to Ávila on the Río Suno an ordeal lasting two months. On this expedition, various combinations of brothers and father often worked in pairs that traveled separately. In particular, Alfonso and Ramón Olalla routinely worked together, as they would throughout their subsequent expeditions in Peru, while Manuel accompanied their father, Carlos. As a result of a serious injury to Carlos' leg while crossing a river on Sumaco, the party started back to Quito. Eventually they had to abandon their equipment, and Alfonso had to proceed alone for help, ahead of the rest. After four days in Quito, he returned to Sumaco where he continued collecting alone until finally returning to Quito on 26 June over a month later. By this time, trips back and forth to Quito had been shortened by a new trail opened by the Olallas from Baeza to the Río Suno.

In 1923–1924, the Olallas collected for Chapman at a variety of elevations on the slopes of the Andes east of Quito (Papallacta, Oyacachi, Cerro Guamani [or Huamani], Tumbaco, Baeza, Puente del Río Quijos, Río Sardinas; altogether 2019 specimens). They twice collected on the western slopes of the Andes near Mindo (189 specimens). In addition, on their expeditions to the Río Suno and Sumaco (1 February–26 April

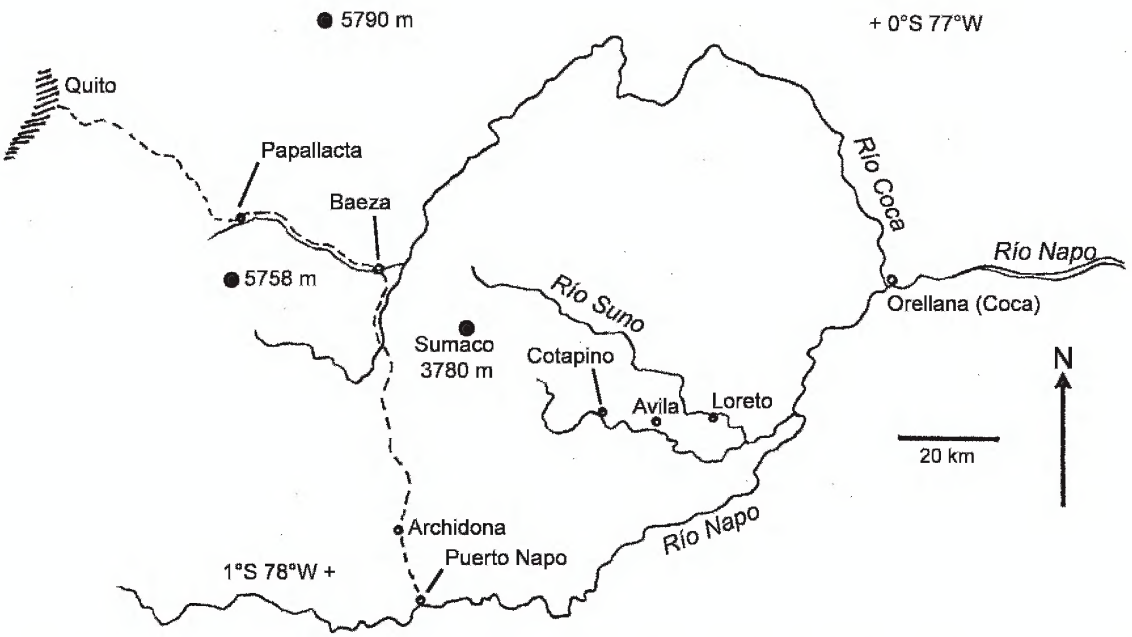

Fig. 1. Map of some localities visited by the Olallas at the beginning of their expedition down the Río Napo and on their previous expeditions to Sumaco, an outlying peak of the eastern Andes in Ecuador.

1923, 1–27 December 1923, 20 January–18 February, 3 March–24 April, 24 May–15 June 1924, based on dates in Chapman, 1926: 21), they amassed an additional 1248 specimens (Chapman, 1926: 21). Nearly 3500 specimens resulted from this early work in Ecuador.

Down the Napo

In 1925 the Olallas' next expedition into Amazonia for the AMNH was even more harrowing than those to Sumaco. The destination this time was the mouth of the Río Curaray, far down the Río Napo beyond the present boundary of Ecuador. Letters between the Olallas and Chapman (Department of Ornithology archives), suggest that the original intention was to collect birds and mammals along the lower ríos Napo, Putumayo, and Caquetá, perhaps not fully realizing the enormous distances involved (Olalla letter, see below) nor the precarious political situation on the Putumayo at that time. On 5 February, however, they signed a contract with Robert Cushman Murphy from the American Museum during his visit to Quito, and on 20 May 1925 the expedition left Quito. Carlos was accompanied by his four sons and an employee, T. Mena.

Alfonso's subsequent report, apparently sent to the American Museum with the second shipment of specimens the following March, presented a terse but vivid account of this expedition. On 25 May the Olallas convened with eight porters who were to carry their equipment from Papallacta to Archidona. After passing Baeza they attempted to cross a swollen torrent by means of a fallen tree. Alfonso and one porter crossed safely, but the next porter fell into the raging river and disappeared, together with $397 worth of equipment. Following this tragedy, the party decided to wait, camping in constant rain, until the river subsided.

Further difficulties in obtaining porters and serious illnesses of Alfonso and Manuel beset the expedition as it made its way toward Loreto, the district capital. At this town, on the Río Suno, they intended to obtain canoes for their trip down the Napo.

On their way to Loreto, however, a delegation from the village of Concepción convinced them to stop there instead. On 30 June they finally reached this village, where the Río Cotapino joins the Río Pucuno (spelled "Pucano" by Alfonso). According to the National Geospatial-Intelligence Agency and U.S. Board of Geographic Names, the town near the mouth of the Río Cotapino is now named Avilá, on the road from Loreto to Archidona, and a village about 9 km to the southwest is named Concepción (fig. 1). The Olallas soon learned that the authorities in nearby Loreto firmly refused to permit any local people to accompany the expedition down the Napo, despite a special trip by Alfonso to plead their case. The expedition nevertheless proceeded to construct canoes for the anticipated trip. In addition, they collected specimens nearby (labeled "Boca Rio Cotapino") and on a side trip to "Cerro Galeras" (now named Cordillera de Galeras), until they ran out of arsenic for preserving the skins. According to Alfonso's report, temperatures were recorded daily at the mouth of the Cotapino 1–31 July 1925 and on Cerro Galeras 12–15 July 1925.

Stymied by the local authorities, the expedition sent Rosalino with three local men to Quito to obtain the necessary permissions. With them were sent all but the largest specimens collected so far, for shipment to the AMNH via Guayaquil. While in Quito, they received a letter from New York stipulating that they should not collect specimens other than those specifically requested. On 28 September Rosalino returned with permissions and supplies, and two days later the expedition embarked at long last in two canoes. The personnel included Carlos and three sons (Alfonso, Ramon, Manuel), T. Mena, and seven local men as paddlers. Rosalino, not mentioned subsequently, must have returned once again to Quito.

On 5 October another hurdle arose at the mouth of the Río Aguarico, at the frontier between Ecuador and Peru, where authorities absolutely refused to allow the local men to pass. Finally on 11 October, the locals were sent back in one of the canoes, while the four Olallas and T. Mena proceeded in the other. "Although they knew nothing about managing the canoes," three days later they succeeded in reaching the mouth of the Río Curaray.

Mouth of the Río Curaray

Alfonso's report stipulated that temperatures were recorded from 16 October to 21 March 1926 at their camp on Isla Panduro near the mouth of the Curaray ("casi junto a la Boca del Curaray"). Specimens were collected during daily explorations along the Curaray and to both shores of the Napo ("exploraciónes diárias a la banda de le Curaráy o en ambas orillas del Napo"). Two months later they had amassed enough of a collection to arrange for its shipment to New York. On 13 December 1925 Alfonso boarded a launch with a shipment of specimens for the AMNH and reached Iquitos on the Río Amazonas a week later.

Iquitos in the 1920s was in dire economic straits. The collapse of the rubber boom in 1914, following two or three decades of wild prosperity, left many people adrift. Much of the indigenous population of Amazonia had been displaced or enslaved during the boom. In addition, large numbers of immigrants had arrived from the highlands and abroad. Many of those who had not left after 1914 now settled as subsistence farmers in communities along the major rivers. The monstrous overlordship of the rubber baron Júlio César Arana on the Putumayo (Hemming, 1987: 309–312) was slowly giving way to tension over international boundaries. Within another decade, armed skirmishes would erupt in this area, including the massacre of one Peruvian garrison. In towns like Iquitos entrepreneurs were desperately seeking some alternative product to export, of which skins of cats and crocodilians were the most promising (Morey Alejo and Sotil Garcia, 2000). Shipping and communications along the Amazon must have been depressed. Steam launches, introduced in Amazonia in the 1850s, would have remained the principal means of long-distance transportation along major rivers.

Alfonso consigned the Olallas' specimens to Booth and Company (a British shipping firm based in Liverpool) for shipment to New

York and also telegraphed a request to Chapman for additional funds. The expedition, according to Alfonso's report, was now broke. Eight days later he received $500 wired from the museum. On 29 December Alfonso embarked for the Río Curaray and arrived a week later. Meanwhile, the rest of the expedition, in financial difficulties, had been assisted by a friendly Ecuadorian who lived about a half day farther up the Napo.

The expedition then made a decision to reduce its size. Expenses were too great for all five people to remain in the field, so Alfonso and Ramón remained at the mouth of the Curaray to continue collecting, while the others left for the return to Quito. The Olalla family would never again work in the field together.

Carlos Returns to Quito

The returning members of the expedition arrived in Quito by 11 March 1926, when a letter from Carlos informed a shipping agent in Guayaquil of his return and requested information about payment for the collection sent from the mouth of the Curaray through Iquitos ("mandado de la Voca del Rio Curaray por Iquitos al Museo"). This letter initiated a prolonged correspondence, most of it preserved in the archives of the Department of Ornithology, between Carlos and representatives of the AMNH about payments. Most of the confusion seems to have resulted from complexities of exchange rates among Ecuadorian sucres, Peruvian soles and pounds, and American dollars. Evidently, most of the payments were made to Carlos in Quito, but some of the money was sent to Alfonso and Ramón in Iquitos. To compound difficulties, the value of Ecuadorian sucres in Iquitos seems to have been lower than the published value in New York. This correspondence reveals some irritation on both sides, but neither Carlos nor the museum ever threatened to terminate relations or to take legal action. Despite the negotiations over payment, there was no suggestion in any of the letters that any specimens from the Río Curaray were carried back to Quito for shipment to New York. All were evidently dispatched from Iquitos.

Another preoccupation in Carlos' correspondence is an effort to interest the museum in further collections from eastern Ecuador. This plan to shift the museum's focus back to Ecuador was perhaps hatched before or during the return from the mouth of the Curaray. It would explain why the returning party, on its way back to Quito up the Río Napo, made an important side trip. A letter from Carlos to Chapman on 29 March 1926 described a digression up the Río Aguarico ("la frontera Ecuatoriana") to the mouth of Lagarto Cocha, in response to reports of interesting birds and other animals there. Carlos' letter stipulated the localities passed on their journey up the Aguarico to Lagarto Cocha including their two stops. The trip thus required about three days by canoe. They arrived on 14 January 1926 and collected from the following day until 26 January, at which point they had exhausted their supplies and continued on their way back to Quito. Carlos' account provided no further information about where specimens were collected. Morning and evening temperatures were reported, but, unlike his son Alfonso, Carlos did not specify the dates.

Carlos' letter said that the specimens were being sent to the museum, presumably in conjunction with his letter. Nevertheless, he was clearly concerned that Lagarto Cocha was not a locality designated in the contract for this expedition. He quoted a phrase in the contract that all specimens collected in the "Oriente" should be sent to the AMNH, but he failed to make a case that the museum should pay for specimens not stipulated in the contract. Nevertheless, Chapman agreed to pay for these unsolicited specimens, although he also emphasized that the museum expected tthe Olallas to adhere to their contract in the future (letter from Chapman on 10 May 1926). In his response on 28 June 1926, after complaining about underpayment for large monkeys, Carlos proposed further expeditions to the Oriente of Ecuador. By this time, however, Chapman had no further need for Ecuadorian specimens and the museum never accepted Carlos' proposals. In a letter of 20 August 1926 Chapman again emphasized that he wanted to stick to the original contract.

Alfonso and Ramón Leave the Curaray

In the meantime, back at the mouth of the Río Curaray, Alfonso and Ramón had assembled another considerable collection by March 1926. At this point, Alfonso wrote a long letter to Chapman dated 22 March from "Voca Río Curaray" to accompany a shipment of specimens. The letter summarized a total of 479 specimens packed in a large case. Accompanying the shipment was his notebook, which he hoped would meet with as much approval as previous ones. He would continue taking similar notes. He also explained that four members of the expedition had returned to Quito but that he and Ramón could complete the work. Alfonso was staying at the mouth of the Curaray until Ramón could send enough money from Iquitos to settle accounts with their Ecuadorian host near the Curaray. Afterward, Alfonso proposed to join Ramón on the Río Amazonas. He requested 25 pounds of arsenic, an essential commodity in those days for preserving specimens in tropical climates, one that the Olallas appear to have repeatedly exhausted. A letter of introduction (presumably to local authorities) was also needed in order to pursue the plans for a visit to the Río Putumayo. Finally, after a few more financial details, he asked that copies of all replies be sent both to the American legation in Quito and to the offices of Booth and Company in Iquitos, presumably so that he and Ramón as well as his father Carlos would remain informed.

Alfonso's next report began with an account of Ramón's trip to Iquitos by launch with the second batch of specimens from the mouth of the Curaray. This was a slow trip, lasting from 28 March to 14 April, as a result of low water in the Napo. Once in Iquitos, Ramón had cabled for additional funds from the museum and then, rather than send money to Alfonso by a third party, he had returned in person between 27 April and 2 May. During the month of Ramón's absence, Alfonso had continued to collect until he had once again exhausted the expeditions's supply of arsenic. On 15 May, presumably with their affairs at the mouth of the Río Curaray settled, the brothers embarked together and arrived four days later at Puerto Indiana (now simply Indiana).

Puerto Indiana

The original contract for the Olallas' expedition is not now in the archives of the Department of Ornithology at the AMNH. The essential conditions, however, can be reconstructed from the many extant letters that Alfonso exchanged with Chapman. Following the collections at the Río Curaray, the contract called for collections on the Río Amazonas near Iquitos in Peru and then on the ríos Putumayo and Caquetá in Colombia (fig. 2). The town of Indiana on the northern bank of the Amazon, not far above the mouth of the Río Napo and below Iquitos, was a convenient base for the next stage of the expedition. In the 1920s, Puerto Indiana was a small village, although today, with the simplified name Indiana, it is a district capital and the largest Peruvian town on the Amazon below Iquitos.

The day after their arrival in Indiana, Alfonso went hunting but returned disappointed that the animals were, with a few exceptions, the same as those encountered previously. Nevertheless, they continued daily explorations along the Amazon as far as the Napo ("limitada por el Río Napo"). They planned to cross the Amazon (nearly 2 km wide at Indiana), but apparently did not because of reports that the land there was entirely flooded and unsuitable for camping ("terrenos ... completamente inundados y imposibles para hacer un campamento"). May and June often have the highest stages of the Peruvian Amazon. Because of a large loop of the Napo near its mouth, this river passes only a few kilometers to the north of Indiana (fig. 3). "As far as the Napo" is thus no farther than about two hours' walk. Evidently, the specimens collected at Puerto Indiana were thus from the northern side of the river in the vicinity of the town.

The work at Indiana was hampered by a lack of supplies. On 28 May Alfonso sent a letter from Iquitos to R.C. Murphy at the American Museum because they had received no reply from Chapman and assumed he was out of town. Alfonso reiterated his request for a shipment of arsenic, 50 pounds this

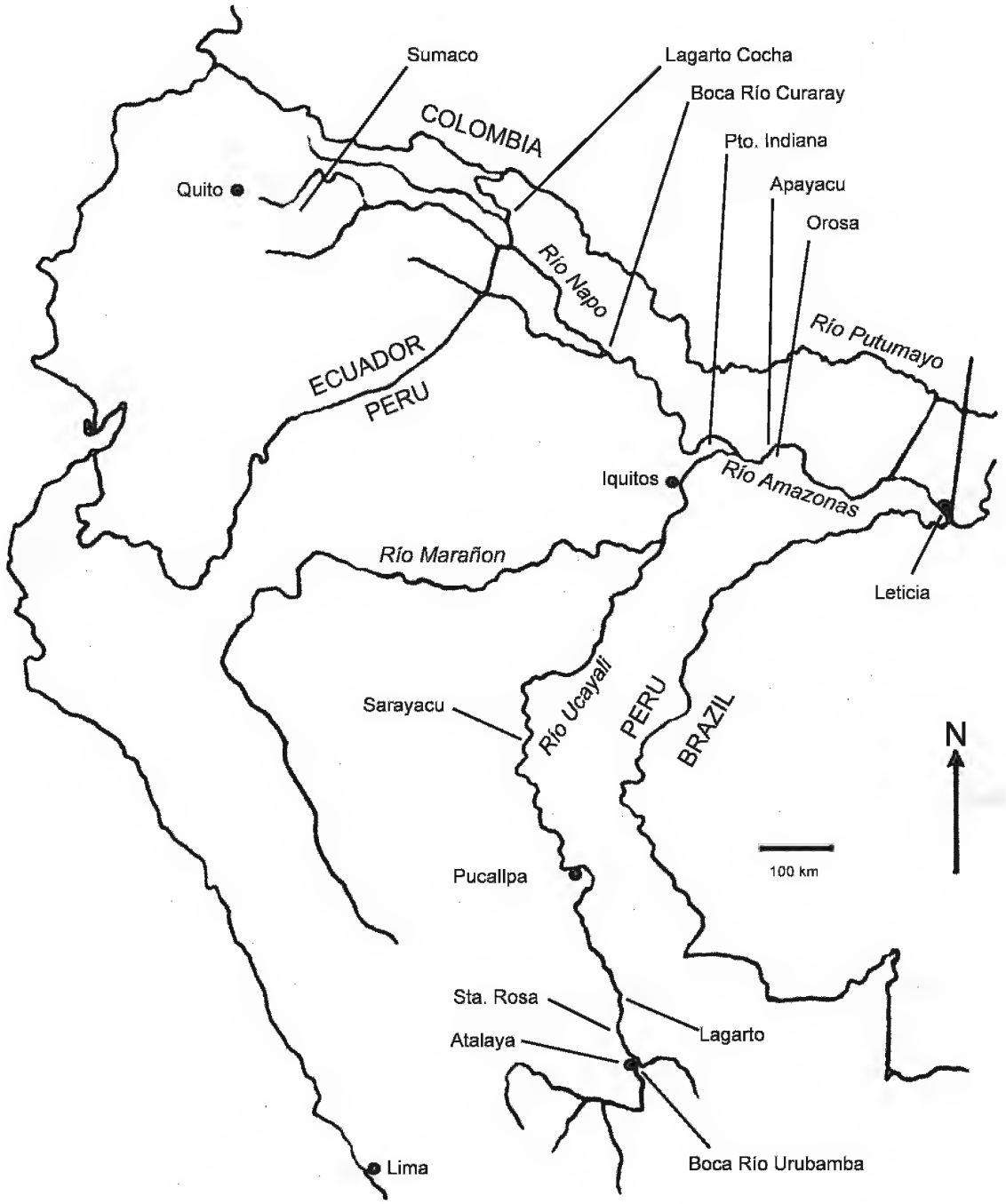

Fig. 2. Map of northwestern Amazonia to show major rivers, modern towns and international boundaries, and locations visited by Alfonso and Ramón Olalla from 1925 to 1928.

time. They had already bought all the arsenic available in Iquitos, and no more could be got at any price. He explained that they remained committed to the work but could not continue without additional supplies. He also suggested that they could collect reptiles for the museum, in addition to birds and mammals, a proposal the museum did not

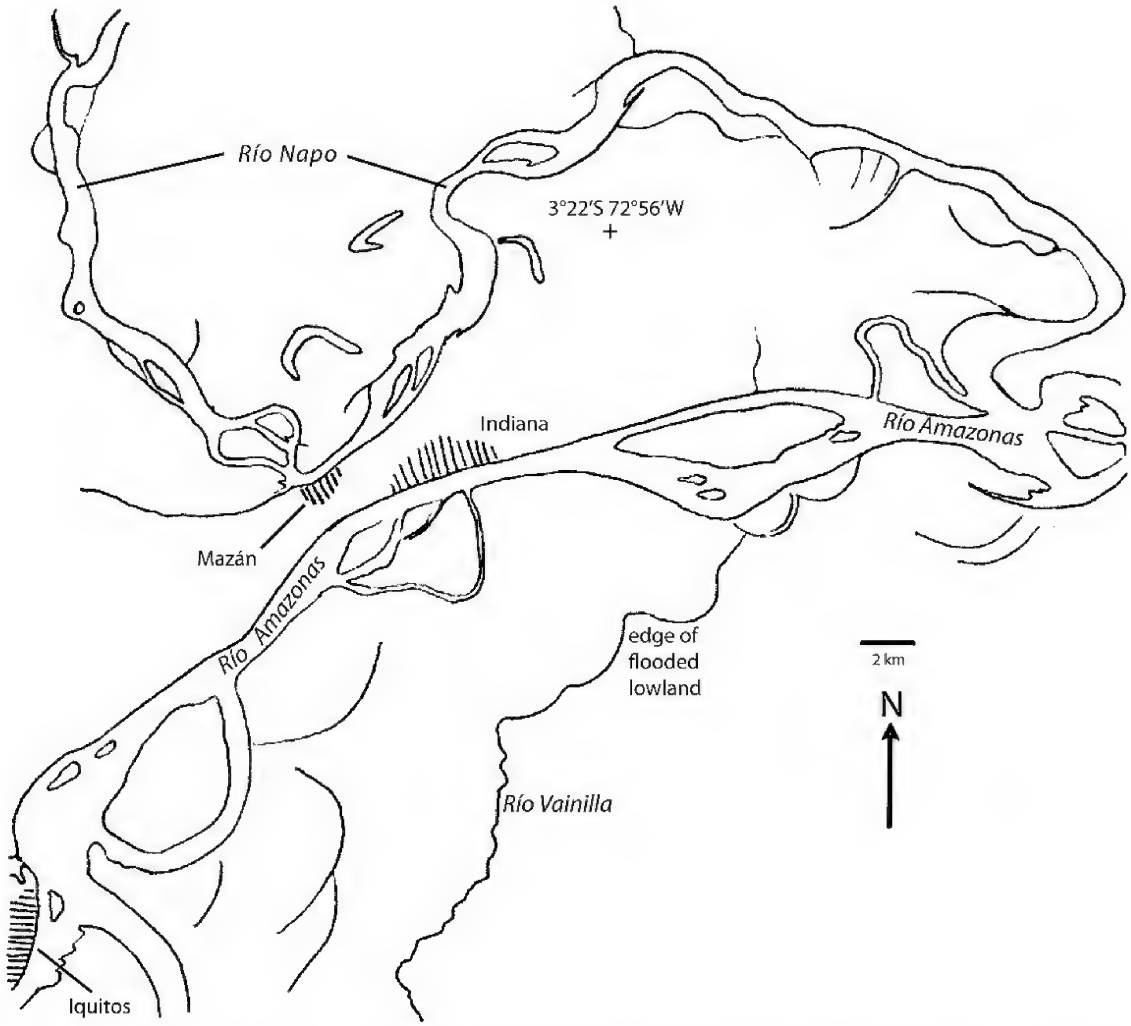

Fig. 3. Map of the vicinity of Indiana (the Olallas' "Pto. Indiana"), departamento Loreto, Peru. The mouth of the Río Napo is about 20 km east of Indiana although the river passes within 3 km to the north. South of the Río Amazonas seasonally flooded lowlands extend to the arcuate portions of the Río Vainilla as indicated. This map and the following ones are based on satellite images from Google Earth (accessed March–December 2008).

pursue. Finally, he requested clarification of the payments he could expect in Peruvian soles, for use in Iquitos, rather than in Ecuadorian sucres. It is noteworthy that Alfonso's letters always requested clarification of payments, in contrast to his father's letters from Quito, which perennially argued for supplementary payments. Alfonso's letters instead focused on the need for supplies unavailable in Peru and for funds to cover unexpected costs of freight and travel. The museum always responded to these requests as promptly as possible, in view of the vagaries of shipping between New York and Iquitos. In fact, this time the arsenic and other supplies had already been dispatched on 17 May.

On 18 June 1926 Alfonso went back to Iquitos, 39 hours upriver by canoe, as he stipulated. With funds replenished, he returned to Indiana on 23 June after canoeing downriver through the night, a journey of

only some 12 hours. Three days later Alfonso returned to Iquitos with two cases of specimens for shipment by Booth and Company. After some difficulty, he also managed to obtain from the customs house a shipment of collecting supplies from the museum, presumably including the essential arsenic.

The collections at Puerto Indiana were completed by 4 August, when Alfonso sent a letter to New York accompanying the last shipment of specimens from this locality. These collections fulfilled the contract for specimens from the Amazon near Iquitos. In the absence of other orders, the brothers now planned to move downriver on the southern side ("en la rivera que limita con terrenos (Brasilero) [sic]"). He added, "We hope to send in the next shipment something more interesting." This dispirited comment suggests that the brothers had found little at Indiana that they had not already encountered at the mouth of the Río Curaray and during the expeditions to Sumaco. They had yet to discover the many different species just a short distance away on the opposite side of the Amazon.

A Move Downriver

In his letter of 4 August, Alfonso had rejected the original plan in the contract with the museum to visit the Putumayo. As he explained in detail, he had discovered that access to the Putumayo was monopolized by the notorious Señor Arana, a rapacious rubber baron, who would control their activities and demand a large sum of money. He reassured Chapman that the expedition was willing to proceed wherever they were directed and requested detailed instructions. The brothers' plan to move down the Amazon toward Brazil (in the direction of the Putumayo, fig. 2) was thus intended to fill time until the museum could provide more specific instructions. Alfonso also proposed another alteration in the contract by asking the museum to send a Kodak camera. In a missed opportunity, the museum ignored this request. Even a few photos of the Olallas' collecting localities would now be priceless. Finally, in this letter of crucial proposals, Alfonso requested that the museum henceforth deal only with the team in Peru and not with "Compañía C. Olalla e Hijos" in Quito. Alfonso and Ramón wished to be on their own.

Chapman was already aware of the impracticality of working on the Putumayo, because, in a letter addressed to Booth and Company on 29 July, he said that he was glad to hear that the Olallas were going to collect at Pebas (downriver from Iquitos) "from which locality we wish to secure a complete representation of the birds and mammals."

Although Alfonso's letter had mentioned seeking a place near the Brazilian border, in fact they got nowhere near that far, and indeed not even as far as Pebas. Alfonso's account said that the brothers planned to seek a site on the south bank of the Amazon, territory not covered in the collections at Indiana, but subsequent events make it more likely that their choice of location was largely fortuitous. Because they had no spare funds for passage on a steam launch, they arranged to have a "casa de balsa" constructed, a raft of logs with a thatched hut for protection from sun and rain. They departed with three men as pilots early on 26 August.

Two days later a sudden storm struck the Olallas' raft just after dark. Although it lasted only 17 minutes, as stipulated in Alfonso's subsequent report, its violence blew their hut away and left their equipment and themselves exposed to the downpour. In an astonishing coincidence, Che Guevara, also short of cash and in nearly the same location, would make a similar journey over 25 years later and experience a similar storm (Guevara, 1995)!

The Olallas' raft became entangled in a fishing weir in the river. The next morning, however, they managed to continue downriver, where they soon found a house and spent the day drying everything in the sun. The following day they landed at Orosa "on the right [southern] margin of the Amazon." The storm on the river, rather than foresight, was probably responsible for this decision.

On 31 August 1926 they set up camp at Orosa (fig. 4), and began collecting the next day. Here they made daily excursions among the islands in the Amazon and the territory toward the Río Yavari ("explor-

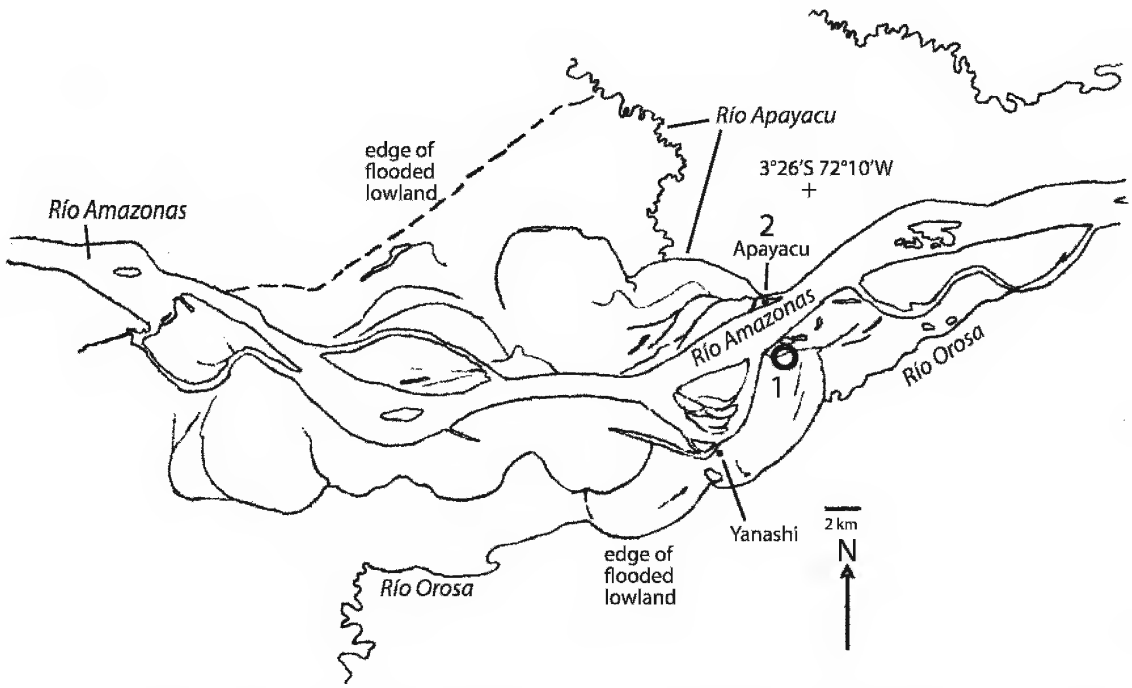

Fig. 4. Map of the lower courses of the ríos Orosa and Apayacu, departamento Loreto, Peru. Seasonally flooded lowlands extend from the Río Amazonas northward to the dashed line and southward to the arcuate portions of the Río Orosa. The Olallas' locality "Orosa" was most likely at or near the circle (1, see text). Their "Apayacu" was at the current town of that name (2), on a small island between the mouth of the Río Apayacu and the Río Amazonas.

aciónes diárias a las isles del Amazonas, o ya a los terrenos que se extienden hasta el Río Javarí"). Toward the Yavarí means more or less southward from their camp (the Yavarí itself, which forms the border between Peru and Brazil, was far beyond their reach). They found the collecting here "de mucha satisfacción," probably because they obtained many species they had not encountered before.

On 22 October 1926 Ramón took cases of specimens to Iquitos for shipment to the AMNH by Booth and Company. The trip upriver, presumably by canoe, lasted four days. His return trip downriver on 1–2 November took only 38 hours. While in Iquitos he obtained an advance of 40 Peruvian pounds for supplies. Alfonso's letter to accompany the shipment, dated 20 October, summarized the specimens included, explained that shipping the collections to Iquitos by canoe cost 50 soles (necessary because travel by steam launch was not easily arranged in their present location), and promised to include the notebook with temperatures and descriptions of the localities in the next shipment. He requested prompt payment for the present shipment, which would cover the cost of travel to the Putumayo or the Caquetá, the expected next destination. In the meantime, the brothers would continue to work at the same place. Alfonso and Ramón, out of touch with the museum for months now, were unsure where to proceed.

A Remarkable Decision and a Reversal of Direction

After another month at Orosa, the brothers made a momentous decision. On 11 December 1926, they crossed the Amazon to the northern bank and camped on an island "on which the Apayacu empties" ("al

márgen izquiérdo ... en la ísla del Amazónas en la cual desembocá el Río Apayacu"). This site is undoubtedly where the village of Apayacu now stands on a slender peninsula (but an island at high water) between the debouching black water of the Apayacu and the silty Amazon (fig. 4). As discussed in more detail below, they had moved only a couple of kilometers.

Alfonso nowhere explained the rationale for this short move, but the continuing pattern of the brothers' activities provides some hints. Most important, despite unpredictable and infrequent communication with the museum, the brothers never stopped collecting. When they had no specific information about what the museum might request next, they always took reasonable steps in anticipation and always kept working. In addition, they had a spirit of exploration.

It was this spirit that must have led them to move directly across the river. The Olallas, by collecting extensively (despite the museum's warnings in the early stages of the expedition about too many specimens) and by daily experience in the field, must have realized that Orosa and Indiana differed markedly in their avifaunas. There would be two possible explanations: either any change of location would produce novelties, or a move across a large river would. The first must have seemed less likely in view of the similarities between their collections at the mouth of the Río Curaray and at Indiana. The conclusion seems inescapable that the move from Orosa to Apayacu was made to test the second possibility. In doing so, the Olallas confirmed the importance of rivers in limiting the ranges of birds and primates in Amazonia, and their collections from Orosa and Apayacu appear to have made Chapman aware of it too.

Neither the Olallas' nor Chapman's letters ever explicitly stated that this discovery had been made, perhaps because the letters in fact never discussed anything but business. Nothing at all about biology was mentioned in their correspondence. Likewise, the Olallas' reports adhered strictly to lists of daily temperatures, standarized descriptions of the areas visited, and the stages of travel along rivers. The evidence that the Olallas and subsequently Chapman realized that they were onto something unexpected is thus circumstantial.

The most important indication of this change was their inattention to the sides of rivers before reaching Apayacu in contrast to afterwards. At the mouth of the Curaray, neither the Olallas' specimens nor Alfonso's field notes provide any indication about locations with respect to the Curaray or the Napo. This information is thus impossible to reconstruct. At Indiana the brothers decided against crossing the river because camping would have been impossible. In contrast, after Apayacu, as explained below, they carefully selected camps to sample both sides of a river.

Scientists at the AMNH showed no awareness of rivers as limits to distributions prior to the arrival of specimens from Orosa and Apayacu. Thereafter, Chapman's instructions were insistent that the Olallas collect from both sides of a river and label their specimens accordingly. Beforehand, neither the Olallas' original contract with the museum nor any of the correspondence from the museum included instructions for visiting both sides of a river, nor even for noting which side of a river their collections came from. Instead the museum issued explicit instructions only for recording temperatures, data relevant to earlier collections in the Andes, but largely irrelevant in Amazonia. Chapman's treatises on the avifaunas of Colombia and Ecuador focus on the Andes as determinants of avian distributions, and he himself never undertook fieldwork in Amazonia. These two treatises never mention rivers as limits of avian distributions. The Olallas' shipment from Apayacu reached Chapman within a year of the publication of *The Distribution of Birdlife in Ecuador* in 1926 and seems to have been a revelation. Chapman's sudden interest in the sides of rivers is best explained by this new awareness. Subsequently, Zimmer's routine attention to riverine limits in his series of papers on the birds of Peru made this biogeographical phenomenon widely appreciated in the ornithological community. The conclusion seems inescapable that the Olallas' decision to cross the Amazon to Apayacu started a chain of events that within a decade

had resulted in a general recognition of this biogeographic pattern in Amazonia.[1]

On the day following their move across the Amazon, Alfonso returned to Iquitos to get mail, which he no doubt hoped would include new instructions from the museum. He took along two additional small boxes of specimens. After four and a half days by canoe he reached Iquitos. He shipped the specimens but had to wait for the monthly boat with the mail. It arrived on 25 December 1926, with payment for the Indiana specimens. Of equal importance were instructions to skip the plans in the original contract for a visit to the Río Putumayo and instead to proceed to the Ucayali. With new supplies, Alfonso returned downriver to Apayacu on 28 December, 27 hours by canoe.

Alfonso and Ramon continued to work at the mouth of the Río Apayacu until 29 January 1927 and then embarked in two large canoes with their equipment and specimens for Iquitos once again. Once there, five days later, they found that no funds had arrived from the museum for this new expedition upriver. A cable to New York eventually produced the funds, but by then the only launch had already departed. Nowadays multiple diesel launches depart every day upriver from Iquitos to Pucallpa and Yurimaguas, but in 1927 there must have been only one every few weeks. The Olallas, not wanting to waste time, headed upriver for the Ucayali by canoe. Alfonso ends his narrative of the brothers' activities along the Amazon by summarizing temperatures at dawn and sunset at Puerto Indiana from 20 May to 25 August 1926, at Orosa from 1 October to 11 December 1926, and at the island at the mouth of the Río Apayacu from 12 December 1926 to 29 January 1927.

Why Chapman decided on the Ucayali as the Olallas' next destination is not explained in his letters. He resumed his correspondence, as preserved in the archives of the AMNH Department of Ornithology, with letters to Iquitos on 4 and 5 May 1927. One, to the Olallas, expressed satisfaction that they had accepted the proposal to work at Sarayacu on the Ucayali but provided no rationale for this location. His enthusiasm for this work seemed qualified as he reminded them not to collect more than the stipulated number of specimens. The other, to Booth and Company, transferred credit to the Olallas' account for the specimens from Orosa and Apayacu and for the cost of shipping them upriver by canoe. Evidently the specimens had arrived safely in New York but had not yet been examined.

Six weeks later, Chapman was much more enthusiastic. His letter to the Olallas on 20 June 1927 emphasized for the first time the importance of keeping track of the side of the river from which specimens came and also proposed an entirely new and ambitious itinerary after Sarayacu. First, he requested a collection at or near the junction of the ríos Ucayali and Urubamba and especially re-

[1] The Olallas were not the first to notice that various Amazonian species were restricted by rivers. Early examples come from Henry Walter Bates and Alfred Russell Wallace, who traveled together during a portion of their expedition to South America. Wallace, in a special section of his *Narrative of Travels on the Amazon and Rio Negro* (1853), emphasized that the Negro, Madeira, Solimões, and Amazon rivers limited the distributions of many, but not all, primates. In addition, he noted that several species of birds were limited by major rivers (the species of trumpeters *Psophia* and several jacamars *Galbula*). Bates (1863) was presumably the source of some of Wallace's information, because he had noted the occurrence of the white uakari monkey *Cacajao calvus calvus* only west of the Rio Japurá near Tefé and the Curl-crested Toucan *Pteroglossus beauharnaesii* only south of the Solimões in Brazil. Subsequent ornithologists elaborated on these patterns. Hellmayr (1910) briefly summarized species limited to the "right" and "left" banks of the Río Madeira (34 and 9 species, respectively), but his lists indicate some confusion of the two sides of the river. Snethlage (1913) lists many birds limited by major rivers in lower Amazonia (ríos Amazon, Tocantins, Xingú, and Tapajós) and recognizes three regions of avian distribution limited by these rivers (Snethlage, 1913: 504–516). Nevertheless these limits pertain only to rivers of eastern Amazonia and, at any rate, are not the primary focus of this paper. The two major catalogs of Neotropical birds before the 1920s included little information about distributions limited by rivers. The *Catalogue of the Birds in the British Museum* by R. Bowdler Sharpe and others (27 volumes, 1874–1895) makes no mention of rivers as limits of Amazonian birds. R.B. Cory and C.E. Helmayr's *Catalogue of the Birds of the Americas* (5 volumes published 1918–1927, others later) includes scant information of this sort. The latter, for instance, mentions two forms of *Galbula* that replace each other across the Amazon in Peru but fails to mention conspicuous limitations in parrots (*Pionites*), antbirds (*Pithys*), or toucans (*Pteroglossus, Selenidura*). Failure to mention the restriction of *Pteroglossus beauharnaesii* to the south bank of the Amazon/Solimões, as emphasized by both Bates and Wallace, is particularly remarkable. From 1931 onward, with the publication of J.T. Zimmer's studies of Peruvian birds, which relied on the Olallas' collections for information about Amazonia, the frequent limitations of avian distributions by rivers in Amazonia became much more widely appreciated.

quested collections from both sides of the Ucayali. Then he proposed an ascent of the mountains between the ríos Ucayali and Pichis, then a collection from Tingo Maria, and finally a collection near Yurimaguas (again from both sides of the river)! The collections from Orosa and Apayacu had evidently infused Chapman with new enthusiasm. The sky was now the limit. He also assured the two brothers that he had already arranged payment for the long trip to the mouth of the Río Urubamba.

The initial decision to substitute the Ucayali for the Putumayo is, however, not so easily explained. Earlier ornithologists had visited neither the Putumayo, nor the upper Ucayali. Apparently, Chapman was formulating a project to treat the birds of Peru in the same way that he had previously monographed those of Colombia and Ecuador. The Río Ucayali in comparison with the more peripheral Putumayo would have presented a larger scope for exploration near the center of Peru.

Sarayacu: First Stop on the Ucayali

Alfonso submitted four separate reports on the expedition to the Ucayali, each apparently sent with a collection from one of the localities visited: Sarayacu, the mouth of the Río Urubamba, Santa Rosa, and Lagarto. The first locality is about half way along the course of the Ucayali from its mouth to its origin at the confluence of the ríos Urubamba and Tambo (fig. 2). The latter three localities are at or not far downriver from this confluence. To reach Sarayacu, the two brothers canoed for five days up the Amazon from Iquitos and then, at the mouth of the Ucayali, found a launch that conveyed them up that river another six days to Sarayacu. This town had been founded in 1791 on the west side of the Ucayali by Franciscan monks as a mission to the local natives. Despite its significance for the extension of Spanish culture into Amazonian Peru, by the late 1800s it had already declined to the minor village it is today.

Alfonso's reports describe three camps used by the two brothers near Sarayacu (fig. 5). The first was on the "left" (eastern) bank of the river opposite the town of Sarayacu. Alfonso as usual denoted sides of the river with reference to his direction of travel rather than direction of flow, so he wrote that the camp opposite Sarayacu was on the "left" side of the river. Peruvians on the rivers of Amazonia follow this convention to this day. From this first camp, the brothers collected specimens on the eastern side of the Ucayali (actually south of the Ucayali at this particular point, fig. 5) from the day after their arrival at Sarayacu (11 March 1927) until 15 April.

From April 16 until May 10, according to Alfonso's report, they collected on both sides of the Ucayali. The brothers did not change the location of their camp, because the river at this point was not wide enough to be inconvenient to cross every day. Nevertheless, on May 11 they moved across the river to a second camp opposite ("frente á frente") the first one. From that date until June 15, they worked only on the "right" (western or at this point northern) side of the Ucayali. Finally, from July 10 to August 15, they used a third camp at a location two hours by canoe southward from the first camp ("dos horas de sureada," a crucial phrase not included in the museum's translation), where they once again collected only on the "left" (eastern) side of the Ucayali. At intervals throughout this period, one or both of the brothers returned to Iquitos to ship specimens to New York, as evidenced by a letter accompanying a box of mammals sent to Harold Anthony, curator of mammals at the AMNH, on 27 May 1927.

The first two camps, as described in Alfonso's report, were located on low ground, with swamps and lakes. The first camp was notable for the nearby aguaje palms (*Mauritia flexuosa*). The second, with fewer swamps, instead had some land cleared by the natives for cemeteries. Amazonian cemeteries are usually located on high ground, above the annual floods, so this locality probably was near a large restinga, a natural levee along a former channel of the river, which now supported tall open forest where not cleared. In contrast, the third camp was on higher ground, with few lakes and no swamps. Tall forest on level ground extended in all directions. Again in contrast to the

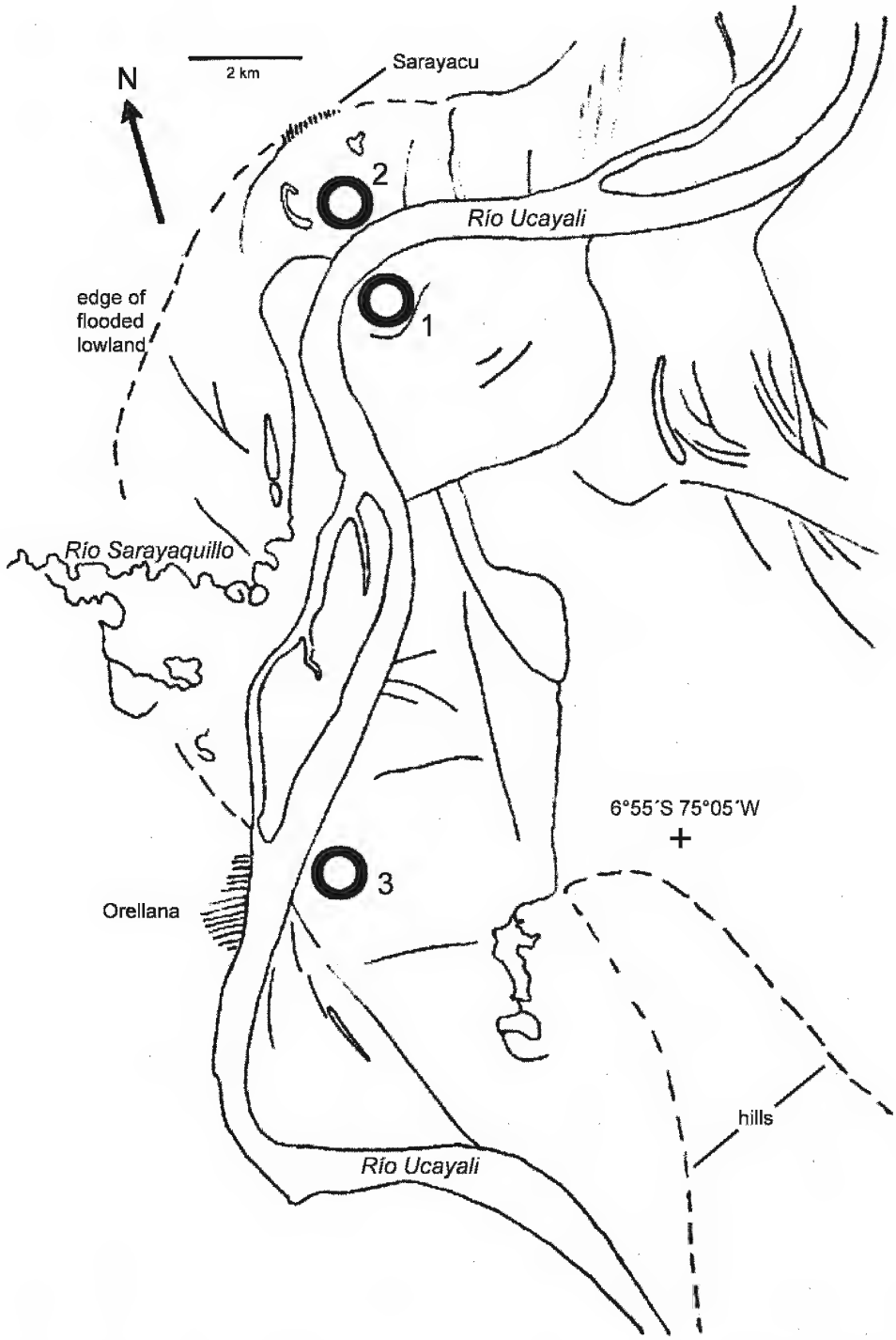

Fig. 5. Map of the vicinity of the village of Sarayacu, departamento Loreto, Peru. A range of hills extends northward within the dashed line east of the Río Ucayali. Seasonally flooded lowlands extend west of the Ucayali to the dashed lines and east even farther. The Olallas' used three camps in this area (1–3, see text), two near the current village and a third farther south most likely across the river from the location of the current town of Orellana.

former camps, this one was in an almost uninhabited area.

The hiatus in collecting between June 15 and July 10 is explained by Alfonso's allusion to their troubles with malaria ("paludismo" omitted in the museum's translation) and unspecified epidemics of the Ucayali and Amazon caused by the "terrible plagues" ("terribles plagas," a term in Amazonia usually denoting great numbers of mosquitos). In addition, the brothers' supplies for collecting and preserving specimens were low. As a result they made one trip after another to Iquitos either to recover their health or to obtain the arsenic that they expected the museum would send in due course. The reports and letters from Sarayacu included Alfonso's first references to the malaria from which Ramón especially suffered until his return to Quito a few years later.

In a letter from Iquitos on 1 July 1927, Alfonso stated that he and his brother had completely recovered from malaria and were returning to Sarayacu to finish their work there. He expressed enthusiasm for the work planned at the mouth of the Urubamba, but he reminded Chapman that they must first receive a shipment with sufficient arsenic and fine shot ("munición fina"), neither of which was available in Iquitos. He also alluded to the great distance from Iquitos to the Urubamba, presumably a reminder that they needed funds for transportation and that they could not travel back and forth to Iquitos as they had from Sarayacu. Once the work at Sarayacu was completed, Alfonso stated, one of the brothers would return to Iquitos to ship the specimens and to collect the supplies.

On 7 September 1927, a letter from Iquitos signed "Alfonso M. Olalla y Hermano" addressed complaints in a letter from G.H.H. Tate on 20 June 1927 about the preparation of specimens. Tate at that time held the position of Field Assistant in the Department of Mammalogy at the AMNH (Anthony, 1954). Alfonso emphatically rejected Tate's suggestion that they had compromised their procedures. From their first collections they had used the same methods, he stated, without previous complaints from the museum. They had avoided all local substitutes ("sustancio silvestre"), so their success depended on the museum's assistance in procuring arsenic. Arsenic bought in Iquitos had already disintegrated and thus could not be counted on for good results. He stated that they had just received enough arsenic for the work so far with little if any left over. He thus requested that the museum send another large supply of arsenic, fine shot, and other supplies for the work at subsequent localities.

He reiterated his enthusiasm for the work on the Urubamba but pointed out that the fares for travel by river were expensive. For example, they expected to spend 28 Peruvian pounds for the trip from Sarayacu to the Urubamba. He anticipated that work on the Urubamba would last 5–6 months, at the end of which time one of the brothers would have to return to Iquitos to collect additional supplies. Finally, he requested precise information about the localities for subsequent collections in the mountainous regions indicated previously by Chapman.

This letter accompanied the last of the brothers' collections from Sarayacu. It confirmed that Alfonso's notes accompanied it, although he apologized for their brevity, as a result of his illness, and promised a fuller account later. Booth and Company in Iquitos must have sent a cable to Chapman two days later, on 9 September 1927, to say that the shipment was on its way. Chapman replied, in a letter of 13 September, that the first shipment from Sarayacu had arrived and that he had authorized payment for it through Booth and Company. He alluded to Alfonso's letter written in July, which had taken two months to reach New York via Lima. Chapman was sorry to hear of the problems with malaria and hoped that the Urubamba would be a healthier locality. There was also a reminder that the museum was particularly interested in the small birds, which have "greater scientific value" (Alfonso later emphasized that the brothers also intended to fulfill the original contract for large specimens, for which they were paid more). Chapman hoped a previous shipment of arsenic, fine shot, and other supplies had arrived, and he promised to send another such shipment.

The problems of communication between Iquitos and New York, combined with both

Chapman's and the Olallas' wishes to avoid delays, resulted in a pattern of letters crossing en route and attempts to anticipate requests. For instance, Chapman did not respond to Alfonso's letter of 7 September until 12 December 1927, by which time the Olallas were already halfway through their work in the south. Nevertheless, he reassured the Olallas that the museum would pay for their supplies and for their travel to the Urubamba. He conceded that he had no precise information about the mountains between the Urubamba and the Pichis and allowed that, if this venture were not possible, the brothers should return to Iquitos and then descend the Río Amazonas to "Teffe" (now Tefé) in Brazil. Once there collections should be made on both sides of the river, with special emphasis on the obscure small birds that live on or near the ground. The Olallas were not to receive these new instructions until months later. Fortunately, the Olallas needed no reminders to collect from both sides of rivers and to obtain complete collections of the small and obscure species. They had themselves discovered the importance of both of these practices. Chapman and the two brothers managed to achieve such remarkable success only through development of a mutual trust.

Three Localities along the Southern Ucayali

Alfonso's first report after finally leaving Sarayacu described two months at the confluence of the ríos Tambo and Urubamba from 7 September to 8 November 1927. The first specimens from this new locality, however, were dated 2 September. The archives of the American Museum do not now contain the original version of this report. The extant English translation is in the same format and style as Alfonso's other reports from the Ucayali and elsewhere, so there is no reason to doubt the former existence of the Spanish original. The discrepancy between the first dates on the labels of specimens and the date in the translated report would be explained if the translator had taken a "2" in Alfonso's handwritten report for a "7." The apparent contradiction between the letter from Iquitos on 7 September and the start of work at the mouth of the Urubamba several days earlier is resolved if we suppose that Ramón took passage directly from Sarayacu to the Urubamba, while Alfonso first returned to Iquitos with the last shipment from Sarayacu before meeting his brother on the Urubamba.

Today the Ucayali above Sarayacu is the location of the important Amazonian port, Pucallpa, the capital of the department of Ucayali (created in 1980 by partitioning the original department of Loreto). Pucallpa only developed into a major port after 1928, when construction began on the railroad from the highlands. For the preceding six years or so, the small village had been virtually abandoned following the Cervantes rebellion (Ortiz, 1962, 1984), and Alfonso did not mention it in his list of the stages on his return to Iquitos. There is also the district capital Atalaya, on the Tambo almost opposite its confluence with the Urubamba. Atalaya, still without an overland connection to the rest of Peru, developed slowly in the 1930s as traffic on the rivers increased. Before then, the upper Ucayali was a remote area, the province of Franciscan missionaries, rubber barons, and shifting indigenous communities (Ortiz, 1974, 1984; Gow, 1991). In the rain shadow of the Sierra Divisor on the Brazilian border, the basin of the upper Ucayali has a drier climate than Amazonia proper. On the wide floodplain, there are few locations with high ground suitable for settlements. At the time of the Olallas' visit, only occasional steam launches would have traveled the river for trade with the indigenous people in scattered villages.

In 1927 nothing anticipated the later development of Atalaya near the mouth of the Urubamba. The Olallas used the house of one Sr. Francisco V. Hernández as their base. Alfonso described this location, between the ríos Tambo and Urubamba, on the western side of the mouth of the Urubamba (fig. 6). He mentioned high forest extending southward for 5 hours of walking from the camp (about 15 km by the standards for travel in Amazonia), sparse populations of natives, areas of "wild cane," and one "white family" living on the banks of the Tambo. The report summarized the range of temperatures at dawn and sunset between 7 September and 7 November 1927 (again the translator proba-

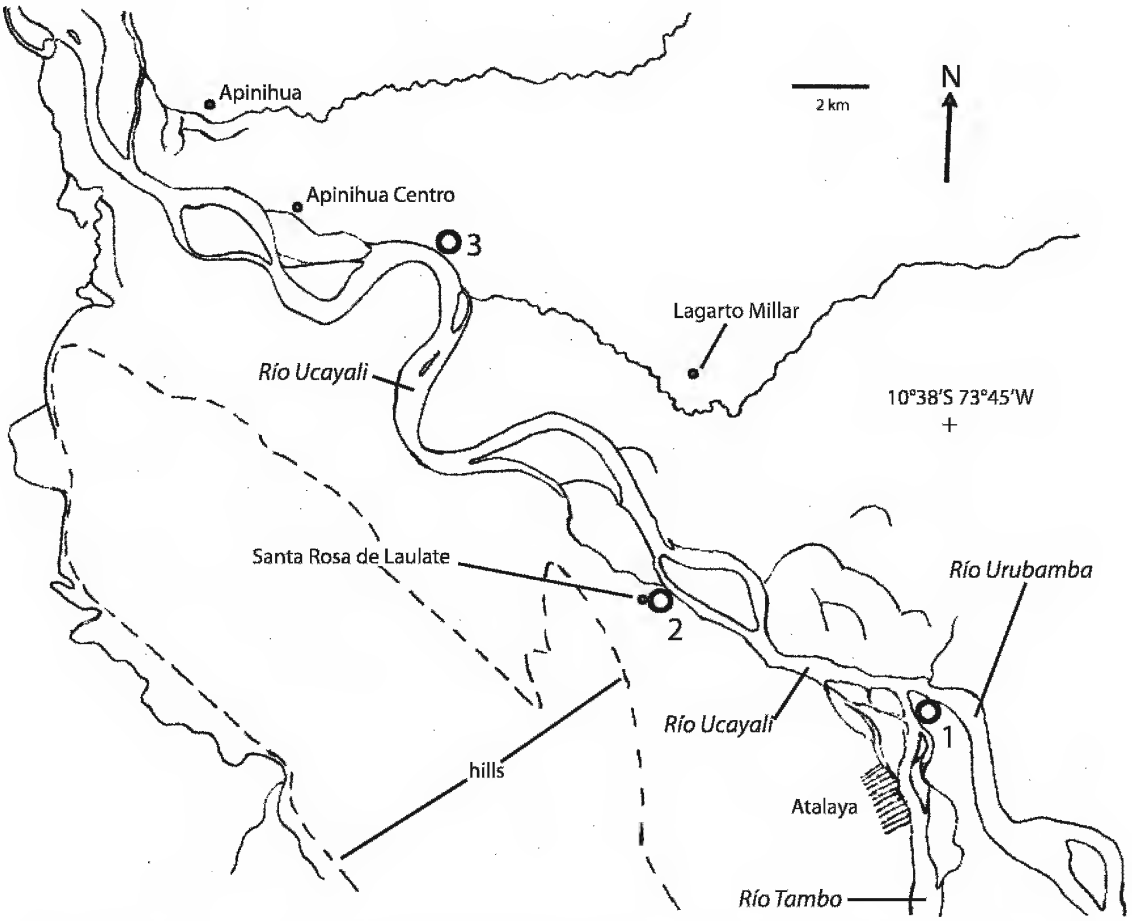

Fig. 6. Map of the origin of the Río Ucayali, departamento Ucayali, Perú. The Ucayali begins at the confluence of the Río Tambo and the Río Urubamba near the current town of Atalya. Foothills of the Andes paralleling the Ucayali, within the dashed line, include a spur that nearly reaches the river. Dots show the locations of several current villages mentioned in the text. The Olallas used three camps in this area (1–3): at the mouth of the Río Urubamba ("Boca Río Urubamba," 1) and nearby downstream to the west ("Santa Rosa," 2) and east ("Lagarto," 3) of the general course of the Ucayali.

bly misread the first date, which was probably 2 September).

Alfonso's next short report is also preserved in the AMNH Department of Ornithology archives solely in English translation. Once again it follows the style and format of his other reports. This report concerns collecting from 12 November 1927 to 6 January 1928 at a "place called Santa Rosa" with a base at "the house of this name." Unlike at the mouth of the Río Urubamba, there were also houses of some "civilized" natives nearby. To the immediate north, lay the Ucayali and an island with the village of San Pablo. With respect to this village, Alfonso explicitly stated that "our explorations did not take us there." The Ucayali also lay east and west of their base, a statement that does not accord easily with the more or less northward flowing river here, a point discussed further below. To the west, hills reached the riverbank. To the south, an hour's walk away, the land became hilly and difficult to penetrate. Here only "wild," as opposed to "civilized," natives lived. Ranges of temperatures at dawn and sunset were provided for the period 12 November to 7 January. Alfonso's report stated that the

ríos Tambo and Urubamba were rising from September to November, an observation expected at the start of the southern rainy season on the slopes of the Andes.

Alfonso also briefly described the trip from the confluence of the ríos Tambo and Urubamba to Santa Rosa. An hour of travel downstream from the confluence, he stated, the river divided to form the island of San Pablo. Santa Rosa was near the downstream end of this island. "We only explored the left bank and downwards," he stated. In this case, as he was traveling downriver, his use of "left" bank with respect to direction of travel, in agreement with European usage with respect to direction of flow, indicates the western side of the river (fig. 6).

Alfonso's final report of the brothers' Peruvian activities, at a place called Lagarto, is preserved in the archives of the AMNH Department of Ornithology. Entitled "Continuation of the report of the trip by the firm Olalla and Sons along the Rio Alto Ucayali Peru," this report is written in the same notebook (a cheap blank book printed and sold in Iquitos) in which Alfonso wrote his report on the brothers' activities at Sarayacu. Alfonso filled in the blank title "Apuntamientos y notas Diarias" and the owner "la Expedicion Olalla e Hijos sobre la Region de Sarayacu, Rio Ucayali (Peru)." He presumably had run out of space in other notebooks by the time he wrote his final report and thus appended it to the report on activities at Sarayacu almost a year earlier. This report on Sarayacu is perhaps the previously promised full report, prepared after the final shipment of specimens from Sarayacu.

The report from Lagarto had the same style and format as the preceding ones, except that it was preceded by a brief explanation of the state of the expedition in early 1928. In particular, the daily temperatures from 8 January through 7 March 1928 were written in columns (not just the range of temperatures provided by the English translation), as they were for the stay at Sarayacu. Like each previous extant report, this one was signed Alfonso M. Olalla, with a great flourish underneath the signature. In this case, though, there was the additional information (omitted in the English translation), "Descripción hecha por Alfonso M. Olalla en el Río Alto Ucayali (Lagarto) el 8 de Marzo del año de 1928." This note confirmed that the report was written at the end of the period covered, so the temperatures were apparently transcribed from a daily record no longer preserved.

The preface to the final report, written in smaller script and apparently more rapidly, is sandwiched between the report on Sarayacu and the report on Lagarto through 8 March. It stated that on 8 January, while Alfonso remained working at Santa Rosa, Ramón had embarked for Iquitos, presumably on a passing steam launch. He took two cases of specimens and also hoped to recover once again from malaria ("para hacerce [sic] curar nuevamente le paludismo que lo atacó").

Alfonso remained at Santa Rosa until 11 January 1928, when he moved to Lagarto on the right (eastern) bank of the Ucayali (fig. 6). It took him 2 hours that afternoon by canoe to reach the new site, twice the time required to travel from the mouth of the Río Urubamba to Santa Rosa. By this time, the river had risen and had developed a fast current. At Lagarto he began collecting the following day. Two months later, on 5 March, a launch heading upriver to the mouth of the Urubamba provided an opportunity to ship more specimens to Iquitos on its return trip. Alfonso had them packed up by 8 March and despatched them three days later, with the notebook containing his report. He remained at Lagarto to continue work.

It is noteworthy that the three sites chosen for work on the upper Río Ucayali, although all within 10–20 km of each other, were located respectively in the three compartments of land formed by the confluence of the ríos Tambo and Urubamba to form the Ucayali (fig. 6). The Olallas had thus investigated all three possible "sides" of these rivers.

To accompany the shipment from Lagarto, Alfonso wrote a letter dated 9 March 1928. He stated that the brothers had now received Chapman's letter of 13 September 1927, presumably forwarded by steam launch up the Ucayali. In response he acknowledged that they had noted the museum's interest in small birds but averred that they had not neglected large (and hence more costly) ones

also, as specified in the original contract. He described how Ramón had returned to Iquitos to cure repeated attacks of malaria despite the fine climate in the upper Ucayali. He proposed a plan for exploring the openings called the Gran Pajonal on the summits of the mountains to the west. Finally, he requested that the museum authorize Booth and Company to pay them immediately on delivery of their shipments, an arrangement that would facilitate their continuing work. No mention is made of Tefé, so Chapman's December letter had presumably not yet made its way upriver.

A translation of Alfonso's report on the remainder of his time at Lagarto is now in the archives of the Department of Mammalogy, although the original is missing. This account states that work on the Ucayali continued until 31 March, when the arsenic for preserving skins ran out. Ramón in Iquitos had forwarded supplies from the museum to Alfonso at Lagarto, who needed them for opening a route to the Gran Pajonal. This plan was not fulfilled, however, because on 7 April Alfonso received a cablegram relayed from Ramón with the museum's latest order to descend the Amazon to Tefé in Brazil. Soon after, by good luck, Alfonso was able to travel down the Ucayali with a merchant as far as the town of "Arellana," presumably the modern town of Orellana near his former camp above Sarayacu. He left Lagarto on 11 April and reached Orellana on 23 April.

Alfonso's report details his itinerary on his return to Iquitos from Lagarto (a document in the archives of the Department of Ornithology duplicates this itinerary). It lists his daily stages presumably by canoe down the Ucayali to "Arellana." Many of the stages are still recognizable towns or tributary rivers: Bolognesi, Sheshea, Contamana, Cushabatay, and Orellana. At Orellana he had to await the arrival of a launch headed for Iquitos from Puerto Bermudez on 27 April. He eventually arrived in Iquitos on 30 April. The report concludes with a summary of temperatures at Lagarto from 8 through 31 March. It thus seems clear that Alfonso continued to work at Lagarto during the month of March. To what extent he ventured across the Ucayali during this time is not clear, a point addressed further below.

Another Change of Plans and Departure from Peru

The final documents in the archives of the Department of Ornithology for the Olallas' activities in Peru consist of letters and receipts from Iquitos in 1928. On 16 January 1928, Ramón signed a bill of lading from G. Delgado e Cia for shipment of large boxes of dried animals ("cajones grandes conteniendo animales disecados") from the confluence of the ríos Tambo and Urubamba to Iquitos, for a cost of eight Peruvian pounds. On 23 January 1928, he signed a receipt for 100 Peruvian pounds forwarded from the AMNH. There is also a custom agent's itemized list of collecting supplies, including 13 kg of arsenic and 30 kg of "municion," imported presumably from New York. On 7 April 1928 Booth American Shipping, 14 Battery Place, New York, sent a letter to Chapman with news that their Iquitos office had received two cases for shipment and that Olalla requested funds to pay their passages to Tefe according to instructions. Letters crossing in transit were a continuing problem.

By this time, Chapman had a new plan in mind for the Olalla brothers. The AMNH was organizing an expedition to explore Mount Duida in southern Venezuela. After convening in Manaus, Brazil, the expedition led by the AMNH mammalogist G.H.H. Tate was to ascend the Río Negro to reach its destination. In an effort to coordinate the Olallas with this expedition, on 5 May 1928 Chapman requested that Booth American Shipping in New York send a cable to their agents in Iquitos: "Send Olallas to Manaos, paying passage. Letters there. Cancel Teffe." Two days later Chapman wrote a letter to the Olallas to explain the change of plans. He requested that the brothers proceed directly to Manaus, where the office of Booth and Company would act as the museum's agents, just as they had in Iquitos. The museum's expedition was not yet certain, but in any event the Olallas were to continue collecting on both sides of the Río Negro and on the south side of the ríos Amazonas or Solimões. Chapman had Alfonso's letter of 9 March and a cable from Iquitos on 7 April with news of two more boxes of specimens, which

had not yet reached New York. When they did, Chapman promised to settle the accounts for the expedition to the Ucayali (with a reminder that the museum had already advanced 100 Peruvian pounds on 23 January and again on 30 April).

In a letter to Chapman dated 24 May, Alfonso expressed some understandable frustration with the repeated changes of plans. In response to Chapman's letter on 12 December 1927, he had gone to some expense in anticipation of opening trails from the Ucayali to the Gran Pajonal atop the mountains to the west. He protested that the changes in plans put them in financial straits, because the funds they earned from the museum were invested in making their subsequent collections ("lo que ganamos, se invierte en hacer las colecciones"). Although he expressed enthusiasm for the work planned in Brazil, he requested that the museum make some changes in their contract. He stipulated that (1) the museum would pay for arsenic, "munición fina," and cotton for wrapping specimens, (2) the museum would have their agents advance half the value of their collections on receiving them for shipment, and (3) the firm Alfonso M. Olalla y hermano (rather than Carlos Olalla e hijos) would henceforth take responsibility for the expeditions and should receive acknowledgment in the museum's publications.

The following day he sent a telegram to New York requesting 30 Peruvian pounds for passage to Manaus. Chapman sent this money promptly, although in a letter of 28 May 1928 he again noted that he was advancing funds before receiving the latest shipment of specimens. He also reiterated that the museum wanted collections near Manaus while the Olallas awaited the arrival of the expedition under the direction of G.H.H. Tate. Alfonso responded to the advance of a further 30 Peruvian pounds in a brief letter on 30 May 1928. The money had arrived just after the departure of the steamboat for Manaus. As subsequent letters from Chapman make clear, the Olallas did not claim this advance. Instead, in order not to lose time awaiting another launch, they departed immediately for Manaus by a local boat. Alfonso requested that Chapman forward the fare for this trip, 14 Peruvian pounds, to Manaus.

On 28 June 1928, Chapman acknowledged the request for changes in the museum's contract. He had authorized Tate to draw up an entirely new contract in Manaus. The payment for specimens would remain the same, and the museum would continue to pay for essential supplies and for long journeys to new localities. His concluding paragraph (which would have been translated to Spanish before dispatch) expressed his feeling about the work so far: "It is a pleasure to add that your work has been satisfactory, that your specimens have been well made, and that your notes have been kept with care; and we trust that you, on your part, appreciate the opportunity which this museum has given you to make large collections and to add widely to your experiences in the field. We hope that we may continue to cooperate to our mutual advantage."

Chapman's list of shipments received through July 1928 and his accounting of their value and the museum's advances and payments showed shipments of birds received from the Ucayali on September and November 1927 and March, June, and July 1928. The average value of a Peruvian pound in this interval was US $3.74. A final accounting showed $1003.70 for birds, $604.50 for mammals, $27.75 for boxes, and $76.59 for transportation between Iquitos and Urubamba, a total of $1712.54. Total payments and advances came to $1609.92, including the final advance of 30 Peruvian pounds for passages to Manaus. This left $102.62 (about 30 Peruvian pounds) still due to the Olallas.

The archives of the Department of Mammalogy include a translation of Alfonso's report on the brothers' activities from June to September 1928, as they traveled from Iquitos to Manaus and eventually joined Tate. The archives of the Department of Ornithology have an itinerary with relevant dates apparently extracted from this document. Alfonso and Ramón departed Iquitos on 15 June 1928 and reached "San Pablo Alivence" (now São Paulo de Olivenção) 13 days later, as appropriate for travel by local boats. Because they were uncertain where the musuem wanted them to work (and furthermore were nearly broke), they

resolved that Alfonso would take the monthly steamer to Manaos, while Ramón and their employees would continue as before to Tefé to await news from Alfonso.

Ramón remained at Tefé until 25 July, when he moved to neighboring Santo Isidoro to find more birds. He remained there until 17 August. The archives of the Department of Ornithology include a translation of Alfonso's report on the stay at Tefé, in the standard format, with the limits of collecting, the nature of the country and vegetation, and a summary of the temperatures between 10 and 25 July 1928. No report is extant on the work at Santo Isidro or near Manaus.

When Alfonso arrived in Manaus on 3 July 1928, he received Chapman's letter of 7 May. In a brief response that day he mentioned that the museum's payments through Booth and Company had all been received. Ramón was healthy. What they had earned in the upper Ucayali had paid for his cure. He expressed concern that the headwaters of the Río Negro were reputed to have many diseases. It was necessary to take antidotes for malaria. Furthermore, they had no further funds to continue work and had thus asked Booth and Company to request an advance from the museum. On 8 July he received notice that no advance would be forthcoming, according to Alfonso's report now in the Department of Mammalogy. Furthermore, he could not obtain permission to stay at a hacienda where he hoped to find the unusual furnariid *Berlepschia rikeri*, a species of special interest to Chapman. On 15 July he instead left for Hacienda Río Negro to resume work. The museum evidently soon changed its mind and sent an advance of $150, for which Alfonso returned to Manaus. He promptly sent funds to Ramón for his passage to Manaus. Alfonso then stayed at the hacienda in Manaus to recover from an illness.

Later in July 1928 Chapman wrote to the Olallas to confirm the museum's support and to request that they put themselves under Tate's direction when he arrived. He then notified Tate that the final shipment from the Upper Ucayali had arrived in New York on 20 July 1928 and, as a consequence, the museum owed them $70.90. Chapman stated that, upon arrival of this shipment, he had cabled Booth and Company in Manaus to advance the Olallas $150 in gold. He urged Tate, "Since their services and good-will are of more value to us than a few sucres ... I think it would be well to make a settlement which is satisfactory to the Olallas." By this point, Chapman obviously regarded the Olallas as a valuable asset for the museum.

Eventually Tate arrived and then, on 20 August, Ramón reached Manaus. Tate insisted that the Olallas and four assistants accompanying Ramón have their health checked, with the result that Ramón entered a hospital for 10 days, evidently for treatment of his recurring malaria. Alfonso in the meantime managed to collect a pair of *Berlepschia* on 1 September, and on the following day he signed the contract with Tate for the expedition to Mount Duida.

Employees ("empleados," "comitiva") of the Olallas are first mentioned in Alfonso's report on the trip from Iquitos to Manaus. The only previous allusion to assistants had been Alfonso's description of local people helping to open trails into the mountains west of the Ucayali. Most of their time in Peru was marked by continual financial difficulties, which would have made hiring assistants problematic. In view of the failure of any previous reports to mention assistants, it seems possible that Alfonso first hired employees on the Ucayali in preparation for a move to the Gran Pajonal. Alfonso's reports of subsequent expeditions for the AMNH, not only the Tyler expedition to Duida from September 1928 to March 1929, but also subsequent expeditions to the Orinoco, Casiquiare, Uaupes, Madeira, Jamundá, Tapajós, Xingu, and sites along the Amazon, all mentioned assistants routinely. In his diary on March 21, 1929, Tate described one of the Olallas' assistants, an adopted 14-year-old boy, Augustin, who had assisted the Olallas for "a couple of years."

Tate had previously led AMNH expeditions to Ecuador, Bolivia, and Venezuela (Anthony, 1954). He evidently took a dim view of the Olallas at their first meeting. On 29 August 1928 he wrote to Chapman, "They came in the first day to me with a great air of assurance, and proved themselves somewhat unattractive to all of us. I decided that I was going to reduce the attack of swelled head

from which they were suffering immediately." To this end, he had drawn up a contract with the Olallas "rather severe in tone ... so that there should be no doubt whatsoever as to their status with the Expedition. Ever since they have been like lambs." After nearly three years of incessant work, recurrent illness, crossed communications, unpredictable finances, and yet unprecedented success, the two brothers Olalla might have justifiably projected some confidence in themselves. Tate, on the other hand, understandably wanted to make it clear who was boss.

The contract, a copy of which is preserved in the archives of the Department of Ornithology, is indeed one-sided in stipulating that the Olallas must obey the orders of any member of the expedition whatever, camp at a distance from the rest, do their own cooking, and maintain cleanliness. The expedition agreed to provide the essential supplies and costs of transportation up the Río Negro to Mount Duida. Tate, on the other hand, could terminate the Olallas services without advance notice. Any member of the Olallas' party leaving the expedition without Tate's permission would sacrifice all pay. If the Olallas continued work on the upper Río Negro, then funds for this work would be deposited with Booth and Company in Manaus. No payment for the work would be made in advance or during the expedition, but only on return to Manaus. The Olallas must pay for their own assistants.

When they first met, Tate was disappointed with Alfonso's small collection from the Río Negro, which he valued at $75. A few days later, according to Tate's letter, Ramón arrived with a "fine collection" from Tefé, valued at $250. After deducting advances totaling $120, he paid the Olallas $200 and left it to Chapman to settle the account after the Olallas had shipped further specimens from the vicinity of Manaus prior to the departure of the expedition. On 3 September 1928, Alfonso wrote to Chapman from Manaus to express his acceptance of the new contract. He apologized for the collections from near Manaus and Tefé that were smaller than usual, but he pointed out that he had successfully obtained *Berlepschia rikeri*. Despite Tate's attitude, Alfonso closed his letter "quedando satisfechos por lo favorable apreciación que el Museo hace de nuestros trabajos, y teniendo esperanza de continuar en la misma forma [remaining gratified for the museum's appreciation of our work and hoping to continue in the same fashion]."

The expedition to Mount Duida had its troubles (Tate, 1931a), but these seem not to have affected the Olallas, who once again assembled impressive collections. Tate's diary made it clear that the Olallas always camped at a distance from the rest of the expedition. His photograph (fig. 7) and admiring description of their well-maintained camp at the base on Mount Duida are preserved in the archives of the Department of Mammalogy. Tate's diaries mentioned that they had constructed their usual two huts, one for a laboratory and the other for a kitchen. The Olallas' and their assistants slept under a tarp Tate had lent them. Tate described Alfonso working under a shawl that exposed only his eyes and nose, in order to keep the insects at bay. Despite Tate's initial impression, he eventually came to appreciate the brothers' and their assistants' industriousness and their orderly camp. They quickly adopted his instructions for preparing specimens of mammals, so that eventually Tate marveled at their beautiful specimens.

While ascending the Río Negro on 4 September 1938, the first day of the expedition, Tate described in his diary how the Olallas prepared birds. It is the only eyewitness account of their methods:

> They use practically no cornmeal; they strip the secondaries of the wings, and later push part of the wing back inside the skin. I don't see how they make the secondaries lie properly after being stripped off the ulna. The cotton bodies they make for their birds are very loose and soft. Their birds' eyes are put in before turning the skin back and pulled part way through the opening in the skin. They sew up their birds with three or four stitches. They dry them in cones and later roll tubes for the skins which they fasten with paste. They break each leg at the top of the tibiofibula before starting to skin, and at the head they cut down through the back of the skull first, and afterwards make the two backward cuts along the mandibles with scissors and also the upward cut between the eyes.

As his diary made clear, Tate obviously enjoyed talking about natural history with

Fig. 7. Alfonso Olalla at the Tyler-Duida Expedition's Central Camp on Mount Duida, photographed by G.H.H. Tate on February 16, 1929. Notice the large numbers of prepared specimens, including many mammals, stored in paper sleeves ready for shipment to New York. Tate's diary on the Tyler-Duida Expedition, now in the Department of Mammalogy at the AMNH, describes his visits with Alfonso, in which they discussed the natural history of birds and mammals.

Alfonso. Soon after the expedition, he included some of Alfonso's unique observations in a note on the habits of South American mammals (Tate, 1931b). Alfonso also repeatedly solicited information about the scientific names of birds and mammals and expressed his desire to learn English and scientific aspects of biology. Ramón, on the other hand, was evidently less memorable. Tate noted only that he always deferred to Alfonso.

Despite his improved opinion of the Olallas, Tate drove a hard bargain in negotiating a contract with the brothers for subsequent work for the AMNH on the ríos Negro and Uaupes. The sticking point was food. The Olallas held out for an allotment for food, while Tate refused to budge in his insistence that the museum would pay only for collecting supplies, the skins received, and travel by river. In the end, he agreed to provide some extra guns and an advance to cover expenses for food. Tate and the Olallas parted company in Manaus in late March or early April 1929, never to meet again, although they maintained a sporadic correspondence (preserved in the AMNH Department of Mammalogy archives) for many years.

As the Olallas' collections arrived in New York, Chapman's confidence in them grew. His communications progressed over the years from initial chiding reminders, strict finances, and tight control to eventual enthusiasm, trust, and even chagrin, when he postponed the final advance for fares to Manaus, on the technicality that the brothers' previous shipment had not yet reached New York.

Between expeditions (and sometimes interrupting them) one or both brothers spent weeks in the hospital in Manaus to recover from illness. Beginning in the last half of 1930, Alfonso led the expeditions in Brazil without Ramón, who by then had returned to Quito (according to letters in the Department of Mammalogy), presumably to recover from mounting effects of malaria.

In the 1930s Alfonso took citizenship, married, and settled in Brazil. He and his crews went on to make large collections for the AMNH, the Museum of Comparative Zoology at Harvard University (Griscom and Greenway, 1941), the Royal Museum in Stockholm (in recognition of which the Academy of Science in Stockholm awarded him its Linnaean Medal), the Peabody Museum at Yale University, the Los Angeles County Museum, and the Museu Paulista in São Paulo (Pinto, 1938–1944). His collections in Stockholm from the ríos Juruá and Purus and from northern Bolivia provided the material for detailed monographs by Gyldenstolpe (1945a, 1945b, 1951), which, like Zimmer's earlier publications, remain cornerstones of our current knowledge about the distribution and taxonomy of Amazonian birds (for the mammals from these expeditions, see Patterson, 1991). Alfonso himself published papers in *Revista do Museu Paulista* (Olalla, 1935a, 1935b, 1937). When Alfonso died in 1971, Paulo Vanzolini wrote his obituary in *Arquivos de Zoologia* (Museu de Zoologia, Universidade de São Paulo) in which he acknowledged his valuable contributions to that museum. Professor Vanzolini, who had visited Alfonso Olalla in the field in the 1960s, described the care with which his crews worked and summarized his feelings about the extraordinary person as follows:

> The contribution of Alfonso Maria Olalla to the collections of this Museum [Museu de Zoologia, Universidad de São Paulo] were of the greatest importance, not only in quantity (he was a major contributor to the collections of birds and mammals) but also in quality. He was a friendly and outgoing person, with an interest in zoological matters that was always fresh. Although a professional collector, he was generous. He understood the value of little things, often giving the Museum specimens that he knew made valuable additions to our collections. We have considered him to be more of a colleague than a dealer and deeply feel his passing (Vanzolini, 1972, translated from the Portuguese).

The American Museum of Natural History, as well as other museums around the world, might all heartily agree. It is difficult to imagine any other person who explored the Amazon basin so thoroughly, or who contributed so much to documenting its birds and mammals, as Alfonso Olalla.

LABELS ON THE OLALLAS' SPECIMENS

All specimens from the Olallas include a label with penciled information on date, location, sex, and size of the gonads (G for

"grande" or enlarged, P for "pequeño" or not enlarged). Evidence presented below suggests that these labels were written at the time the specimens were prepared. No doubt Chapman's early instruction included this basic procedure. In contrast, collectors in the preceding century often first attached a small label with a number for cross-reference with their notebook and only later added a label with information about the specimen. The Olallas' had blank labels printed in advance, following the practice of the AMNH expeditions in the preceding decades, with all information in common for the expedition, so that only the particulars about each specimen had to be added.

The handwriting on all the Olallas' labels from collections in Ecuador, Peru, and Brazil from 1923 through 1930 resembles the handwriting in Alfonso's handwritten reports sent to the American Museum with shipments of specimens. There is some variation in the formation of letters and numerals, but I have not detected any pattern to these differences. It is possible that Alfonso himself prepared most of these labels, but it is also possible that Alfonso, his father Carlos, and his brother Ramón all intentionally standardized the letters used on the labels. For instance, the specimens from Lagarto Cocha (where Carlos worked without his two sons) and from the last months at the mouth of the Río Curaray (where Alfonso and Ramón worked without their father) all have labels with handwriting similar to that during the first months at the Curaray (where they all worked together). As Alfonso's collecting continued in Brazil, his writing on labels slowly evolved but remained recognizably similar to that on earlier labels.

The blank labels used by the Olallas were evidently printed in batches, at least some of which can be differentiated by slight variations in format. Each batch was used consistently for a block of dates, often more or less corresponding to an expedition. For their first expedition to Sumaco in 1923, for instance, they had standard AMNH labels printed thus:

> American Museum of [extra space] Natural History / ... [location] [date] / Olalla & Sons. / E. Ecuador. Tropical Zone. (verso) [blank]

where a slash indicates a new line, dots a blank line, and square brackets enclose my own notes about format or about information entered on the labels later. For their second expedition to Sumaco the following year, they must have had a new batch of labels printed:

> Fecha...[date] Sexo... [sex then gonad, each followed by a period] /Loc... [location] / OLALLA Y HIJOS-ECUADOR (verso) Am. Mus. Nat. Hist. No.

Perhaps these were printed in Quito without Chapman's supervision. Note that the American Museum's name is abbreviated and placed on the verso and that the name of the Olalla firm is printed in capital letters, entirely in Spanish, prominently on the front.

Labels identical to the last were used for all specimens from the mouth of the Curaray and the mouth of Lagarto Cocha. Indeed, specimens from all subsequent localities in Peru, with the exception of Sarayacu, also had identical labels, except that each label has a neat stamp in ink, "PERU," added after "ECUADOR." All of these labels had a vertical black line to mark the left margin, and all had the proximal corners trimmed.

The brothers used different labels at Sarayacu. These lacked the vertical line (although the corners were trimmed) and had been printed,

> Fecha ... Sexo ... / Loc... / Carlos Olalla e hijos / QUITO-ECUADOR ["PERU" stamped neatly to right of "ECUADOR"] (verso) [space] Am. Mus. Nat. Hist. / No.

A small number of specimens from the mouth of the Río Urubamba also have these alternative labels, which also reappear in Brazil later, as we shall see. Alfonso never mentioned a shortage of labels in his letters to Chapman, which often urgently requested other supplies, so the labels presumably came from elsewhere. The incorrect country on the labels suggests that they came from Quito, sent by Carlos to his sons for use in Peru.

After leaving Peru, the brothers still had some of these labels remaining. Although they continued to use them, they introduced progressively more corrections. On the Río

Negro in 1929 and Río Madeira in March 1930, they used labels of the second type, above, with "Y HIJOS-PERU" lined out and "Bros" and "Brasil" added in the same handwriting as the date, location, sex, and gonad. On the other hand, on the Madeira in February 1930, they used labels of the third type, like those at Sarayacu, except with "Carlos," "e hijos," and "QUITO-ECUADOR" lined out and "Bros" and "Brasil" added, again all in the same handwriting. The changes in the name of the firm correspond with Alfonso's requests beginning in 1928 that Chapman deal directly with the two brothers (and eventually just Alfonso) without including their father, who was by now far from the scene of operations.

The close resemblance of the handwriting on all labels from Ecuador and Peru suggest that Carlos, Alfonso, and Ramón worked together closely to standardize their procedures, even the formation of the letters and numerals in their writing. Presumably they also attempted to standardize their procedures for determining the sex and the state of the gonad for each specimen. There are only a few specimens for which the sex is indicated"?". On all other specimens the state of the gonad is recorded. Nearly all dates on the labels, as explained below, correspond to those on which the two brothers worked at each locality according to Alfonso's reports. The exceptions are plausibly explained by a common human error: a few specimens prepared in the first week of a new year have the preceding year erroneously written on the label (for instance, "Boca Río Urubamba, 2 January 1927" instead of "... 1928"). Note that these occasional errors in dates in early January are compelling evidence that the labels were actually written as the specimens were prepared, rather than at some later time. The localities on the labels from Peru all stipulate only the locality of the camp and never provide more specific locations or habitats within each general area, a point discussed in more detail below.

In summary, the Olallas' labels fit all expectations for labels prepared at the same time as the specimens to which they were attached. The close correspondence between the kinds of printed labels, the localities, the dates, and the corrections to the labels, on the one hand, and Alfonso's reports, on the other, tends to confirm the contemporaneousness of the labels and the specimens.

LOCALITIES OF THE OLALLAS' COLLECTIONS IN PERU AND NEARBY

Introduction

Each of the Olallas' collecting localities has raised problems in the ornithological literature. At least one of the Olallas' locations, according to Vaurie, was an outright fabrication. Less serious problems include the country in which the location is now located, the side of the river on which the brothers worked, and in some cases the approximate location of the camp.

The Olallas' labels in Peru indicate only the locations of their camps and never include additional information about the habitat or circumstances in which a specimen was collected. As we have seen, Alfonso's reports included brief descriptions of the scope of their operations at each camp and the corresponding terrain and vegetation. As the Peruvian expeditions continued, these remarks became more specific, but they never were as detailed as those in Alfonso's subsequent reports from Brazil. On the expeditions to the Orinoco and the Río Negro in 1929 and 1930, for instance, Alfonso added small maps of each collecting locality to indicate the scope of operations and the extent of important habitats. These maps usually encompassed an area about 5–6 km around the camp, about the distance that a field worker on foot might cover in a morning's work. Native hunters can cover greater distances, but intensive collecting would restrict activities to a smaller area.

The following sections review evidence from various sources, including Alfonso's reports, about the Olallas' collecting localities in Peru. I have visited a number of these sites in person. Satellite imagery now available on the Internet provides further information. Google Earth in particular provides latitude and longitude based on WGS84 datum (all coordinates provided below were obtained in March 2008). GPS coordinates from the field

were obtained with a Garmin 12-satellite unit (WGS84 version current in 2000). I have also consulted the American Geographical Society's "Map of Hispanic America," including the supplement, as well as other sources of Peruvian place names.

I have examined almost all of the Olallas' specimens in the AMNH, as well as many others (including almost all the Tyranni) in the ANSP, MCZ, FMNH, and BM. The numbers of specimens examined in the AMNH are included in the accounts below. The Olallas' specimens from Peru in other museums were all obtained by exchange or purchase from the AMNH. The catalogs in the Department of Ornithology indicate these exchanges, and their numbers and localities correspond well with the holdings in other museums. In particular, the AMNH catalogs and the holdings of other museums show that many specimens from the mouth of the Río Curaray, Puerto Indiana, Orosa, and Apayacu were exchanged, but none from localities on the Río Ucayali. As explained below, a small number of the Olallas' specimens from Peru reached the AMNH in the Bassler Collection, rather than in their own shipments. Otherwise, so far as I have ascertained, the Olallas shipped all of their other material from Peru directly to the AMNH.

The specimens sent to ANSP resulted in a minor misunderstanding about the Olallas' localities inadvertently propagated by Stephens and Traylor (1983). When Bond (1945–1956) published his series of notes on Peruvian birds in the collections of the Academy of Natural Sciences in Philadelphia, he listed all specimens from Peru in this collection, most of which had been obtained by M.A. Carriker, Jr. (Bond, 1956). He also listed the Olallas' specimens purchased from the AMNH on 29 June 1928, but (as Tom Schulenberg pointed out to me) Bond failed to indicate who had collected these specimens and thus left the impression that it had been Carriker. As a consequence, Stephens and Traylor (1983) subsequently listed Carriker as a collector at the relevant Ollalas' locations (mouth of the Río Curaray, Puerto Indiana, Orosa, and Apayacu). In fact, only the Olallas collected at these localities and not Carriker.

Boca Río Curaray

The Río Curaray, a well-known river (fig. 2), is navigable by cargo vessels from its mouth on the Río Napo upstream beyond the current international boundary with Ecuador. In Peru the Curaray is not more than 250 m wide, has no islands, and meanders densely (in some stretches with a period of 2.0 ± 0.5 km and an amplitude of 3.8 ± 0.2 km) within a floodplain 7–9 km wide. The mouth of the river is thus unlikely to have changed location by more than a kilometer or two in the past century. Google Earth provides coordinates of 2°21′48″S, 74°5′26″W, within 200 m of a GPS reading in 2001.

One source of confusion about this locality in the ornithological literature stems from the Olallas' labels that state "Ecuador" rather than Peru. The international boundary between these countries, fixed by an international commission in the Protocol of Rio de Janeiro in 1941, was finally accepted by both nations with minor modifications in 1998. Nevertheless, Alfonso's account of their journey down the Río Napo in 1925 made it clear that the boundary was in its current position at Rocafuerte even then. Perhaps the Olallas, like other Ecuadorians, had not yet accepted the de facto boundary. At any rate, while at the mouth of the Curaray, they did not correct their preprinted labels stating "Ecuador." Consequently, for decades ornithologists recorded these specimens in the avifauna of Ecuador, not Peru. For instance, Zimmer first listed these specimens from Ecuador. Beginning with his 43rd installment of *Studies of Peruvian Birds*, which appeared soon after the protocol of 1941, he correctly listed "mouth of Río Curaray" under Peru (Zimmer, 1942). In his revisions of the Cracidae, Vaurie (1964–1967) also correctly listed these specimens in Peru. Nevertheless, not long afterwards, Vaurie (1972) failed to include this location in his gazetteer of Peruvian ornithological localities. Stephens and Traylor (1983) corrected this omission, and subsequently all ornithologists have recognized that this locality is well within the boundaries of modern Peru.

Recent satellite images show two major islands in the middle of the Río Napo

opposite the mouth of the Curaray, both about 0.5 km from each bank. Alfonso's account of the camp on Isla Panduro almost next to the mouth of the Curaray ("el campamento general estaba situado en la ísla Panduro, casi junto a la Boca del Curaráy" or "entre la confluéncia del Napo y el Curaráy") suggests an island more closely associated with the mouth of the Curaray than any current island. If so, the arrangement of islands in this part of the Napo has changed in the past 75 years, not an unlikely possibility considering the rate at which islands in large Amazonian rivers change in size and location. At any rate, Alfonso's description does not allow us to specify the exact island on which the Olallas camped.

His use of the term "campamento general" suggests that there might also have been temporary camps nearby. They had a large team working here, so it is possible that some individuals ranged widely. Alfonso's notes describe the scope of their trips, which extended to both sides of the Napo and along the Curaray ("exploraciónes diárias a la banda de le Curaráy o en ambas orillas del Napo"). With some effort a person could travel 10 km upriver by canoe in 2 or 3 hours, spend a morning collecting, and return downriver in 1 hour. On the densely meandering Curaray, such an excursion would reach only half that distance in a straight line from the mouth of the river. Nothing in Alfonso Olalla's reports allows us to determine exactly where any of the specimens were collected with respect to the Curaray or the Napo. It is not until later that they made a point of locating nearby camps on opposite sides of a river. Furthermore, as discussed below, the Olallas' collections do not suggest that much of their effort was spent on islands.

Recent satellite images suggest that immediately east of the Napo, in a major bend of the river, is a large aguajal, a backswamp dominated by aguaje palms *Mauritia flexuosa*. On the other hand, ridges oriented NW-SE within 3–5 km to the south of the confluence of the Curaray and the Napo reach 30–35 m above the rivers, which here are about 125 m above sea level. The area thus provides an unusual breadth of habitats for lowland Loreto.

The catalogs of the Department of Ornithology at the AMNH do not list the Olallas' specimens in the order collected. Charles O'Brien, who cataloged most specimens between the 1920s and 1950s, often had a backlog of work (Mary LeCroy, personal commun.). Sometimes he left space in a catalog for an earlier acquisition while he cataloged a later one, and sometimes he never returned to the first. When Mary LeCroy began cataloging specimens in the 1950s, she often filled in blank spaces in earlier catalogs. In some cases, O'Brien noted when an acquisition had been received and when he began and finished cataloging it, but in other cases he did not. The Olallas' specimens from the Ucayali (Sarayacu, Boca Río Urubamba, Santa Rosa, Lagarto) were entered in the catalog in three batches. Those from Puerto Indiana, Orosa, and Apayacu were all cataloged in one batch, with annotations about the dates of arrival and cataloging. This latter batch included some specimens from Boca Río Curaray and Boca Lagarto Cocha, but most of the material from these two locations is cataloged in a batch along with specimens from several locations in Ecuador in March and July 1925. There are no notations in this latter case of when the specimens were received or when the cataloging took place.

The catalogs include approximately 7625 specimens of birds from the Olallas' collections in Peru (table 1), many subsequently exchanged with or sold to other museums, especially the MCZ and ANSP. I have examined 6329 of these specimens (table 2), all that were available in the AMNH collections during several visits from 2004 to 2008 (presumably all that were cataloged except those on loan and those exchanged permanently). Of this total, 1261 came from Boca Río Curaray.

Of these 1261 specimens, all had dates on the Olallas' labels between 15 October 1925 and 15 May 1926, although there were relatively few after January (table 2). Alfonso's first report stated that work began on 15 October. On 9 January most of the expedition left to return to Quito, as described earlier. On 21 March Alfonso and Ramón prepared to leave for Iquitos. In his next report, however, Alfonso made it clear that

TABLE 1
Catalog numbers of the Department of Ornithology (AMNH) for birds in the Olallas' collections

Localities	Catalog numbers			Dates cataloged		Received		Notes
	First	Last	N	Start	End	Date	N	
Pto. Indiana, Orosa, and Apayacu	230443	233076	2633	Aug 1927	Sept 1927	?	?	Including some specimens from Boca Río Curaray and Lagarto Cocha; many specimens exchanged with ANSP and MCZ
Sarayacu	237431	238707	1276	10 Oct 1928	19 Nov 1928	Nov 1927	1256	
Lagarto	238757	239595	838	21 Nov 1928	10 Jan 1929	Jun 1928	838	
Boca Río Urubamba and Sta. Rosa	239596	240885	1276	17 Jan 1929	6 Feb 1929	?	?	Except 239864–876
Boca Río Curaray and Lagarto Cocha	254760	257126	2366	?	?	?	?	About 1600 specimens from Boca Río Curaray and Lagarto Cocha with the remainder collected by Olallas in March and July 1925 at four localities in Ecuador
TOTAL (Peru, including Lagarto Cocha)			7623 (approximately)					

TABLE 2
Numbers of specimens of birds collected by the Olallas in Peru and examined in the Department of Ornithology (AMNH)

Locality	Passeriformes		Other	Totals	Dates	
	Passeri	Tyranni			Earliest	Latest
Boca Río Curaray	269	544	448	1261	15 Oct 1925	15 May 1926
Lagarto Cocha	17	53	41	111	15 Jan 1926	26 Jan 1926
Pto. Indiana	170	375	272	817	19 May 1926	23 Aug 1926
Orosa	88	234	369	691	1 Sept 1926	7 Dec 1926
Apayacu	146	147	144	437	9 Jan 1927	29 Jan 1927
Sarayacu	153	404	567	1124	11 Mar 1927	14 Aug 1927
Boca Río Urubamba	52	132	236	420	2 Sept 1927	5 Nov 1927
Sta. Rosa	77	431	226	734	12 Nov 1927*	10 Jan 1928
Lagarto	65	441	228	734	11 Jan 1928	31 Mar 1928
TOTALS	1037	2761	2531	6329		

*One *Pipra coronata exquisita* has the date "2 Nov. 1927," probably a slip of the hand for "2 Dic. 1927."

he left for Iquitos alone and that Ramón stayed behind at the Curaray although most of his supplies had been exhausted. Only after Alfonso's second return from Iquitos did the two brothers finally leave the Curaray on 15 May 1926. The dates on their specimens thus correspond exactly to the dates of their residence at the Curaray according to Alfonso's reports. Alfonso's second report, covering the final departure from the Curaray, was sent to New York after the brothers' subsequent trips to the Orosa and Apayacu, much later than the last shipment of specimens from the Curaray.

The small number of specimens after January 1926 is partly explained by the smaller crew in the field but mostly by the lack of supplies, especially arsenic for preserving skins. Evidently the brothers curtailed collecting when they could not follow the AMNH procedures for preparing specimens. A letter from Tate at the American Museum on 20 June 1927 cautioned the brothers about using local substitutes for arsenic, a possibility that Alfonso emphatically denied in his response on 7 September, when he pleaded for additional shipments of arsenic from New York.

Boca Lagarto Cocha

This locality, where the returning Olallas stopped on a detour during their trip upriver, is also easily located today. The Río Lagarto Cocha is a small tributary of the Río Aguarico, itself a tributary of the Napo. The current international boundary between Ecuador and Peru follows the lower Agarico and the Lagarto Cocha. As mentioned above, Carlos Olalla's letter stated that it took three days to canoe up the Río Aguarico to reach the Lagarto Cocha. It also referred to the Lagarto Cocha as the route to the Putumayo, so there is no doubt this locality is the currently recognized Río Lagarto Cocha on the border of Ecuador and Peru.

Carlos had nothing to say about where his party camped or collected at the mouth of the river. Lagarto Cocha, despite its name ("cocha" means *lake* in Quechua), is a small blackwater river, less than 50 m wide, that meanders southward through hilly terrain. Recent satellite photos show the mouth of the river at 0°39′18″S, 75°15′41″W, but it appears that this mouth is recent, formerly having been about 2 km SW. Like many similar cases in Amazonia, the lower course of the tributary lies within the floodplain of the larger river and parallels it for some distance, often following old channels of the larger river. On some occasion, the tributary cut through the narrow separation to form a new mouth upstream. The most remarkable feature of Lagarto Cocha is the extensive complex of blackwater lakes and swamps straddling the international boundary for some 30 km beginning about 5 km upstream from the current mouth. This area is prob-

ably the source of the name Lagarto Cocha ("lagarto" is *caiman* in Amazonian Spanish) and also of the local reports received by Carlos that the area had interesting birds and animals.

The major uncertainty about this locality is whether the specimens, including the type of *Thamnophilus praecox* (Zimmer, 1937), should be included in the avifauna of Ecuador or Peru. Because Carlos gave no hint of the scope of collecting around the mouth of the river, the specimens could have come from either country. Although officials monitored movements on the Napo at Rocafuerte at the mouth of the Aguarico, it seems unlikely that any officials constrained the Olallas' movements along the Río Lagarto Cocha in 1926. Specimens from Lagarto Cocha all have the Olallas' usual labels with "Ecuador" preprinted on them, but, as we have already seen, the Olallas used these labels for all specimens from the Curaray also, which they knew full well was far beyond the de facto international border at Rocafuerte. The labels thus provide no justification for assigning the specimens to one country or the other. In view of the narrow width of the Lagarto Cocha, it seems unlikely that any bird or mammal, or human explorer, would be limited to one side or the other. A reasonable approach, thus, would be to include the specimens from Lagarto Cocha in the avifaunas of both countries.

The specimens of birds from Boca Lagarto Cocha, of which we examined 111 in the Department of Ornithology, have dates from 15 January through 26 January 1926, in agreement with Carlos' report in the letter he posted from Quito on their return.

Puerto Indiana

This town, now named simply "Indiana," with several thousand inhabitants, must have had only a few houses in the 1920s. The Map of Hispanic America (sheet SA-18, 1938, 1949) does not include any such locality. Even decades later, a detailed description of the Peruvian Amazon (Faura Gaig, 1962) described only a small village with a Franciscan school. At that time there were plans to connect the town with nearby Mazan on the Río Napo. This road, finished in 1975 and paved in 1989, according to local residents, no doubt contributed to the town's growth. Indiana is on the left (northern) bank of the Río Amazonas on the narrow neck of high ground that separates this river from the large southern loop of the Napo some 40 km above its mouth (fig. 3). No doubt for centuries there has been a trail across this neck to permit people and cargo to portage from the Napo to the Amazonas on the way to and from Iquitos. The alternative name, Puerto Indiana, used by the Olallas, is thus appropriate. Google Earth has coordinates 3°30′10″S, 73°2′40″W.

The isthmus between the Amazonas and the Napo is 3.5 km wide at Indiana. At its narrowest, about 3 km SW of Indiana, it is only 3.0 km wide. To the east of Indiana it rapidly widens. Nowadays some 10 km of the isthmus, including the area around Indiana, is deforested except for about 150 ha on property owned by Explorama Tours. The stretch of the Amazonas opposite Indiana is as narrow as anywhere in Peru, about 1.0–1.1 km wide, and the river is about 98 m above sea level at this point. The isthmus in the narrowest section reaches elevations about 10 m above the river, but not far ENE or WSW, elevations exceed 20 m above the river. No varzea (seasonally flooded forest) occurs along the northern bank of the Amazonas near Indiana (the closest is over 25 km ENE). On the Napo side of the isthmus, however, large tracts of varzea begin about 7.5 km NNE of Indiana. Directly southward across the Amazonas from Indiana is a complex of large islands within a looping channel of the river. On this southern side of the Amazonas for a long way both up- and downstream, varzea extends at least 10 km from the main channel.

There is no indication that the Amazonas has altered its course in this area in the past century, so the situation at the time of the Olallas' visit was presumably similar to the present one, except that the town was much smaller and the surrounding area less extensively deforested. As Alfonso's report specified, the brothers began daily exploration along the bank of the Amazonas on 20 May 1926 as far as the Río Napo ("recorriéndo en exploraciónes diárias la ribera del Río Amazonas, limitada por el Río Napo").

The report emphasized that they did not cross the Amazon because the terrain on the opposite was flooded and unsuitable for camping. The Amazonas reaches its maximum stage in May and June (some 10 m above the minimum in November), so during the Olallas' visit nearly all of the land opposite Indiana would have been inundated. None of the brothers' specimens from Indiana is a species now known to occur only on the southern side of the Amazonas. Their collection thus presumably came from the area now mostly deforested on the isthmus between the Amazonas and the Napo within 5–10 km of the modern town of Indiana.

The catalog of the Department of Ornithology at the AMNH shows that the specimens from Indiana were cataloged along with those from the Olallas' next two localities, Orosa and Apayacu, in August and September 1927 (table 1). We examined 817 specimens of birds from "Pto. Indiana" in the AMNH, all dated between 19 May and 23 August 1926 (table 2), in agreement with Alfonso's report of when they worked there. They embarked for their trip downriver on 26 August.

Orosa

The Río Orosa is the largest southern tributary of the Amazonas between the mouth of the Napo and the historic town of Pebas on the northern side of the river (figs. 2 and 4). Presumably the brothers chose this location largely because of the storm that wrecked their raft. After spending a day drying out at a house on the bank of the Amazonas, they traveled only a few hours farther to reach Orosa ("el lugar de Orosa"). Beginning on 1 September 1926, they explored islands of the Amazonas and the area that extends southward toward the Río Javarí (also spelled Yavarí) ("haciéndo exploraciónes diárias a las isles del Amazónas, o ya a los terrenos que se extiénden hasta el Río Javarí"). No mention is made of a river nearby, nor of the town of Pebas.

It seems almost certain that the brothers made their camp in the general vicinity of the Río Orosa near the southern (left) bank of the Amazonas, but their description makes it difficult to determine the exact location. Although their itinerary did not include enough time to travel a substantial way up a tributary before camping, they would have learned from local people that the Río Orosa provides a route to the Río Javari. From the headwaters, many days by canoe upriver, it is possible to cross overland to the Río Javarí-Mirim and then to descend to the Javarí. Recently this route has been used by logging crews (personal obs.). Even with motors, it takes a number of days to reach the Río Javarí, so it is unlikely that the Olallas traveled that far while collecting. The absence of any mention of a river in Alfonso's report tends to confirm that canoeing upriver was not a major part of their activities. "Hasta el Río Javarí" is best interpreted to mean "in the direction of the Javari," in other words generally southward from their camp.

The brothers often camped near the mouth of a river, so their locality "Orosa" was presumably near the mouth of that river. Even if we accept this possibility, it is difficult to determine where this site might have been in 1926. The Orosa is an extreme example of a frequent pattern of tributary rivers in the Peruvian Amazon. Its lower course parallels the Amazonas for about 40 km, never more than 8 km away, before reaching its mouth (fig. 2). The river appears to have incorporated one old channel of the main river after another into its lower course. Its current mouth in a narrow channel behind a large island suggests that this process is continuing. Consequently, it is likely that the mouth was considerably farther west nearly 80 years ago when the Olallas visited. The village at the current mouth of the Orosa is Huanana (INEI, 2008, locally called Huanta). Another village named San José de Orosa about 14 km WSW of the current mouth of the river is directly opposite the mouth of the Río Apayacu (GOREL, 2005; INEI, 2008, however, shows this town farther south on the current course of the river, a location to which the town perhaps moved after the river changed its course). Because towns at the mouths of rivers in Amazonian Peru often take their name from the river, San José de Orosa might have formerly been at the mouth of the river. Indeed the Map of Hispanic America (sheet SA-18, 1949) shows

a town named Orosa at this location embraced by two mouths of the river.

The vestiges of this former mouth of the Orosa still exist. Just upriver from San José de Orosa a secondary channel of the Orosa empties into the Amazonas (about 15 km WSW of the current principal mouth; fig. 2). This secondary mouth faces a cluster of islands near the southern bank of the Amazonas, just as Alfonso's description states. There are no other islands in the main river until well below the current mouth. In addition, this site is directly opposite the mouth of the Río Apayacu, the next locality visited by the two brothers, who reached it by crossing the Amazonas one afternoon.

The current mouth of the Orosa, on the satellite images of Google Earth, is at 3°29′07″S, 72°03′02″W, where it empties into a long channel behind a large island. The probable location of the Olallas' camp, near the current (or former) village of San José de Orosa, is near 3°31′31″S, 72°11′22″W (fig. 2). The land along the southern side of the Amazonas for a long way in either direction from the mouth of the Orosa (either current or previous) is on the floodplain of the Amazonas, which is some 15 km wide at this point. The forest within 6–8 km of the Amazonas is seasonally flooded varzea. At the time of the Olallas' visit, however, the river would have been at or near its lowest stage for the year, so this forest would have been easy to traverse on foot. The current course of the Orosa now skirts the edge of high ground along the edge of the floodplain. Wherever the mouth was in the Olallas' day, a trip of 5 km or so upriver would have provided access to terra firme forest.

We examined 691 specimens of birds from "Orosa," all dated between 1 September and 7 December 1926 (table 2). None of these specimens is a species now known to occur only on the northern side of the Amazonas. None is a species now known to be restricted to islands in major rivers (see below). Alfonso's mention of visits to islands might instead explain the large series of migrating shorebirds from Orosa, presumably collected on mud banks exposed by the falling river in the months of their visit. The Olallas collections are thus in agreement with Alfonso's reports and most likely from a location somewhat west of the current mouth of the Río Orosa.

Apayacu

This locality is also associated with the mouth of a well-known river, the Río Apayacu, a major northern tributary of the Amazonas between the Napo and the town of Pebas (figs. 2 and 4). Local people are careful to avoid confusion between the Río Ampiyacu, with its mouth at Pebas, and the Río Apayacu, with its mouth considerably farther upriver. Vaurie (1972) was confused about this locality. His gazetteer included two entries. One (APAYACU RIVER, "mouth of river, near Pebas") he places at 03°21′S, 72°08′W. The other (APAYACU "[Ampiyacu, or Auayacu]") he equates with the Islas Apayacu in the Amazonas, which he places at 03°23′S, 72°08′W. These two sets of coordinates are about 3 km apart about 14 km NNE of the mouth of the Río Apayacu. Local people today might well call the island just upstream from the mouth of the river "isla Apayacu," but the island is not large enough to have had much permanence over the course of decades. Vaurie's account thus conflates two adjacent but distinct rivers.

Although the Map of Hispanic America (sheet SA-18), on which Vaurie relied, was extensively revised between the editions of 1938 and 1949, both versions clearly distinguish the Ampiyacu and Apayacu rivers and indicate "Isla (or Islas) Apayacu." On the much-improved later edition, these islands lie well below the mouth of the Apayacu approximately opposite the current mouth of the Orosa where a cluster of large islands still exists.

Alfonso's report stated that the brothers worked at Orosa until 11 December 1926. On that date they crossed the Amazonas to camp on the island in which the Río Apayacu debouches ("se campáron en la ísla del Amazónas en la cual desemboca el Río Apayacu"). This reference to an island puzzled Vaurie, who assumed it referred to islands named "Isla (or Islas) Apayacu" in the middle of the Amazonas on the Map of Hispanic America (sheet SA-18, which includes these islands in somewhat different

locations in its 1938 and 1949 editions). These islands, however, do not correspond to the Olallas' locality. Instead, the arrangement of the mouth of the river matches Alfonso's description exactly.

The Apayacu, like other Amazonian tributaries previously discussed, parallels the main river, in this case only for 7–8 km, and incorporates part of a former loop of the Amazonas (fig. 4). It then meets another more recent loop of the Amazonas, which has become the current mouth. Until recently the town of Apayacu, with about 20 houses, was located on the narrow spit of land between the final course of the Apayacu and the Amazonas. During periods of high water the town was surrounded by flooded forest for many kilometers in all directions. As a result of extreme erosion during high water in 2008 and 2009, the town was relocated upriver. By 2010, the narrow spit of land had almost disappeared. No doubt the Olallas camped on this spot, where it is likely that a small village already existed in the 1920s. On Google Earth's satellite images the location is 3°29′20″S, 72°10′55″W.

Alfonso's report made no mention of the extent of their explorations around Apayacu. With the exception of *restingas* (former natural levees of the main river), no high ground exists near Apayacu. The floodplain of the Amazonas, unusually wide at this point, extends about 12 km northward. There is a small island in the Amazonas that would have been easily accessible, but, unless substantially larger in the 1920s, it would not have taken long to explore.

We examined 437 specimens of birds from Apayacu, all dated between 11 December 1926 and 29 January 1927 (table 2). The collection includes all of the expected species now known to occur only on the north side of the Amazonas and none of the species now known to occur only on the south side. No species restricted to islands, nor shorebirds, are represented. The composition of the collection is thus consistent with Alfonso's report.

Sarayacu

The Olallas, as described above, worked near Sarayacu during two distinct periods between March and August 1927. During the first period they used two different camps across the Río Ucayali from each other, although Alfonso's report stated that during part of the time at the first camp, the brothers collected on both sides of the river. During the second period of work near Sarayacu, they camped at a third location some distance upriver. Sarayacu is thus actually three localities in the same general vicinity. Alfonso's notes together with recent satellite images allow us to reach some conclusions about where they camped and collected during these six months.

Sarayacu was originally a mission founded by Franciscans who descended the Ucayali in 1791. In the first half of the 1800s, it was the most important port of call for travelers on the Ucayali and was visited by a number of Europeans and Americans, including several ornithologists (see Stephens and Traylor, 1983). There is another Sarayacu, on the Río Bobonaza in southern Ecuador, which Clarence Buckley used as a base for assembling a large collection of birds in the 1890s (Sclater and Salvin, 1880; Jenkinson and Tuttle, 1976) and where a later Olalla collected for the Museum of Comparative Zoology in the 1960s. Alfonso and Ramón's labels, however, are not ambiguous, because by the time they visited Sarayacu on the Ucayali the brothers had begun to correct their printed labels by stamping "Peru" on each one.

Sarayacu is now a village (with Google Earth coordinates 06°47′28″S, 75°06′51″W) along the edge of high ground, slightly over 2 km from the left (overall western) bank of the Ucayali, which at this point flows nearly eastward in one of its large loops (fig. 5). The surrounding administrative district is still named Sarayacu, although the village is no longer its capital. The Map of Hispanic America (sheet SB-18, 1938) shows Sarayacu some 15 km west of the Ucayali and 20 km NNW of Orellana. The orientation of the river at Orellana and the location of the Contamana hills ("Cerros de Canchyuaya") is approximately correct, but the location of Sarayacu on this map is misleading.

According to Alfonso, the brothers' first camp was on the "left" bank of the river opposite the town and their second camp was

on the "right" bank opposite the first. We have already noted that, by local custom, "left" referred to the general direction of travel. For the Olallas ascending the Ucayali and thus traveling generally southward, the village of Sarayacu would have been on their right (the side to the west of the general course of the river). With reference to the direction of flow, the first camp was on the right bank and the second camp on the left.

Alfonso's descriptions of their first two camps correspond closely with the terrain on the two sides of the river immediately in front (south) of the village. The high ground occupied by the town forms the edge of the floodplain. To the south for some 2 km before reaching the current bank of the river, the terrain consists of densely spaced *restingas* (natural former levees) with tall forest and a few small lakes and clearings. On the opposite side of the Ucayali, low-lying land extends 6 km from the river with numerous lakes derived from former channels of the river. Alfonso stated that the terrain near both of the first two camps was low-lying with wet soil.

Near the first camp, according to Alfonso, there were many swamps with aguaje palms (aguajales). The forest was flooded to a depth of 4–5 m ("Está anegado hasta una distancia de 4 ó 5 metros sobre el nivel de la montaña, ó sea el agua penetra en la selva"). This depth would represent a high stage of the river, usually reached in May, coinciding with the Olallas' visit. Only at lower stages would lakes become apparent. During rising water, mosquitoes are often abundant, as the Olallas noted repeatedly.

Near the second camp, according to Alfonso, there were fewer aguajales but the ground was nevertheless wet. In places the forest had been cleared for cemeteries, an indication of land above the level of annual flooding (see above). High *restingas* are still used for cemeteries by riverside communities in Amazonian Peru.

Neither of these camps offered easy access to terra firma. The town sits on an eastward-projecting peninsula of high ground. To the west the land slopes upward gradually for some 30 km to the outlying foothills of the Andes. To reach terra firma, the brothers could have walked westward beyond the cleared areas around the village. The small meandering Río Sarayaquillo enters the Ucayali from the west just above the presumed locations of their first two camps. Alfonso makes no mention of this tributary, so apparently it was not used by the two brothers. To the east of these camps they would have had to traverse 6–9 km of flooded varzea to reach high ground.

Alfonso's report stipulated that specimens collected from 11 March through 15 April 1927 came from the "left" bank "opposite the old village of Sarayacu" (on the generally eastern side of the river), those collected from 16 April to 10 May came from both sides of the river, although they remained at the first camp. Subsequently, specimens obtained from 11 May to 16 June came from the "right" bank while they were at their second camp.

After a hiatus in Iquitos to replenish supplies and to recover from malaria, the brothers returned to Sarayacu where they used a third camp from 10 July to 15 August. During this time, specimens were collected on the "left" bank again, so presumably they camped on that bank also. According to Alfonso's report, this third location was two hours by canoe south of the earlier camps ("á dos horas de sureada en canoa desde los primeros campamentos"). Two hours upriver in a loaded canoe would take them about 8–12 km almost due southward to a point approximately opposite the current town of Orellana (with Google Earth coordinates 6°54′44″S, 75°09′22″W), the capital of the district Vargas Guerra. Once again the terrain opposite Orellana fits Alfonso's descriptions of the area around the brothers' camp.

Just above (south of) Orellana the Ucayali makes a right-angled bend, which embraces a large triangular area with terrain much like that around the first two camps (with numerous former channels and *restingas*) (fig. 5). Behind this low-lying area is a zone about 3 km wide that lacks these indications of flooded varzea. This northwesterly trending zone is a continuation of the Contamana hills (Cerros de Canchahuaya), an outlier from the more rugged hills toward the Brazilian border. On recent satellite images this zone supports many agricultural plots

(chacras). Lying behind the triangular block of flooded varzea, this zone reaches the bank of the Ucayali in two places, one opposite Orellana and another 10 km upriver, around the right-angled bend, at the northwestern end of the Contamana hills (fig. 5). Later, in his final report from Lagarto, Alfonso mentioned that the Contamana hills are the only place on the eastern side of the Ucayali where the river adjoins high ground. Because they lie a little farther upriver from the brothers' third camp at Sarayacu, where they had not yet explored, Alfonso does not mention these hills in his reports from Sarayacu.

According to Alfonso, the third camp occupied land that flooded only in exceptionally high water. There were few lakes and no swamps. The land was flat, and from the banks of the river the forest was high and easy to move through ("fácil de hacer correrio"). At that time, there were almost no inhabitants. This description seems likely to have applied to the zone, now thoroughly cultivated, that extends northwestward from the Contamana hills to a point opposite Orellana. The area opposite present-day Orellana is the most likely location of the third camp.

If these interpretations of the Olallas' three camps near Sarayacu are correct, then their coordinates from Google Earth are approximately 6°49′04″S, 75°06′22″W (first camp), 6°48′36″S, 75°06′37″W (second camp), and 6°54′28″S, 75°8′35″W (third camp) (fig. 5).

We examined 1124 specimens of birds collected by the Olallas and labeled Sarayacu (table 2): 261 from 11 March–15 April, 304 from 16 April–10 May; 122 from 11 May–16 June; and 417 from 10 July–14 August. All fell within the dates stipulated by Alfonso's report, except one "Egretta alba" (*Ardea alba*) dated "17 June 1927." Of the total, 678 came from the "left" bank (east of the Ucayali), 122 from the "right bank" (west of the Ucayali), and 304 from the period when collections were made on both banks.

The third camp was close to the narrowest section of floodplain along the entire course of the Ucayali. At their northern end, the Contamana hills approach within 1 km of the eastern bank of the river. On the other side, SW of Orellana, outlying hills of the Andes approach within 9 km of the western bank. These two ranges of hills are only 25 km apart at their ends. The floodplain between them narrows to 6 km wide and the river itself to 0.3 km, by far the narrowest between the origin of the Ucayali at the confluence of the Urubamba and the Tambo and its mouth at its confluence with the Marañon. This gap divides the lower Ucayali from the drier upper Ucayali, which lies in the slight rain shadow of the rugged hills along the Brazilian border (Sierra Divisor). Throughout its course the upper Ucayali meanders through a floodplain 20–30 km wide.

Boca Río Urubamba

This locality, between the confluence of the ríos Tambo and Urubamba according to Alfonso's report, is readily located on satellite images at coordinates 10°42′25″S, 73°45′00″W (fig. 6). Today the small city Atalaya, a provincial capital, occupies the western side of the Tambo just above the confluence and no more than a few kilometers from the Olallas' old campsite. Like Pucallpa, Atalaya became a population center and capital only in the 1930s and 1940s (Ortiz, 1974, 1984).

Alfonso's report accurately described the orientation of the two rivers at the confluence (the Urubamba flowing from the east, the Tambo from the south). He mentioned a small canal of the Tambo that flowed into the Urubamba just above the principal confluence. Today this canal has evidently become the main channel of the Tambo, and a secondary channel (presumably the main channel in the Olallas' day) now joins the Ucayali just below the confluence. Alfonso mentioned Campos and "Peios" (Piros), both of which are described as "civilized Indians," which occupy essentially the same areas today (the Piro east of the Campo) (Gow, 1991). Alfonso described high forest extending to the south on low terrain for "up to 5 hours walking from the camp," beyond which the surface became stony. Recent satellite imagery shows the land between the Tambo and Urubamba rising gently to the south. About 10 km south of the confluence, ranges of low hills first appear and clearings for cultivation disappear. The detailed corre-

spondence between Alfonso's account and the conditions at the mouth of the Río Urubamba leaves no doubt that the brothers actually camped here, despite Vaurie's widely circulated conclusion that this locality was fabricated by them.

The Tambo and Urubamba are each about 300–500 m wide near their confluence. Alfonso's report is unclear about whether the brothers' explorations extended across these rivers. Nevertheless, it seems likely that they limited their activities to the peninsula between the rivers, because their next two camps seem to have been chosen expressly to explore the nearby western and eastern sides of the Ucayali. Alfonso' report stipulates that temperatures were recorded here from 7 September to 7 November 1927.

In the AMNH Department of Ornithology, we examined a total of 420 specimens labeled "Boca Río Urubamba" with dates between 9 September and 5 November 1927 (table 2). An immature *Tigrisoma lineatum* from this locality has a discolored label with a date now illegible.

Santa Rosa and Lagarto

These two localities are the last collecting sites visited by the Olallas before they shifted their operations to Brazil. The two are not far apart, as Alfonso's report stipulated that he traveled from Santa Rosa to Lagarto in two hours by canoe. Such a trip would cover a distance of about 15–20 km by river. Furthermore, Santa Rosa was only one hour by canoe from the mouth of the Río Urubamba. Alfonso stipulated that Santa Rosa was on the "left" bank and Lagarto on the "right" bank. As he was now traveling downriver, "left" would correspond to the west side and "right" to the east side of the general course of the river.

From Alfonso's description, Santa Rosa was in a large loop of the Ucayali with the "left" bank of the river lying both east and west of the brothers' camp. Furthermore, the river included a large island to the north on which was located a village named San Pablo. He stated that this island began about one hour downriver (perhaps 8–10 km) from the confluence of the Tambo and Urubamba. Santa Rosa was located opposite the (presumably far) end of this island. A house on the riverbank served as a base of operations. To the east of camp the land was flat, but to the west hills rose from the bank of the river.

The locatity called Lagarto (Alfonso's report always stipulated "denominado Lagarto," as if the name were unusual or not well-known) lay between two small streams ("pequeño riachuelo") where Alfonso camped at the house of one Señor Rios. Alfonso described the limits of his collecting as the Río Ucayali itself to the north, the Riachuelo Lagarto to the east, and the Riachuelo Apenihua to the west. To the south, east, and west the ground was low, with a few small swamps as a result of flooding by the river and torrential rains. To the south there was high forest, much like in lowlands along the lower Ucayali and Amazonas. Aside from Sr. Rios' house, the area was uninhabited. Between Santa Rosa and Lagarto were many islands, and two islands were east and west of Lagarto respectively, apparently just bars that disappeared at times of high water. He noted that the "left" (eastern) side of the Ucayali was flat from its origin to its mouth, except below Contamana, where, as noted above, hills come close to the river.

Recent satellite images reveal candidates for both of these locations (fig. 4). A range of low hills reaches the western bank of the Ucayali about 10 km northwest of the confluence of the Tambo and Urubamba, and two small creeks enter the Ucayali from the east about 15–20 km northwest of these hills. Based on these geographic features, it is reasonable to place Santa Rosa near 10°40′55″S, 73°49′10″W and Lagarto near 10°35′50″S, 73°52′40″W.

Current place names confirm these locations. INEI (2008) lists two small communities about 20 km northwest of Atalaya named Lagarto and Apinihua. There is also a town named Santa Rosa between Atalaya and Lagarto. Coriat names eastern tributaries of the Río Ucayali named Apinihua and Lagarto in approximately the locations identified above (Coriat, 1942: 196) and presents a map with towns named Santa Rosa and Lagarto roughly 10 and 20 km northwest of the mouth of the Río Urubamba, respectively on the west and east banks of the Ucayali

(ibid.: 192–193). Faura Gaig (1962) also includes Santa Rosa in his description of the upper Ucayali in a location not far below Atalaya and on the same side of the river, and Ortiz (1984) includes maps that show Santa Rosa and Río Lagarto in this area. The Instituto de Bien Comun, which assists native communities to acquire title to surrounding land, lists "comunidades nativas titulados" named Lagarto Millar (10°37′26″S, 73°48′49″W), Santa Rosa de Laulate (10 40 54 S, 73 49 28 W), Apinihua (10 33 55 S, 73 55 53 W), and Apinihua Centro (10 35 30 S, 73 54 40 W), each readily located on Google Earth. The first is associated with a river called "Quebrada Lagarto" and the third with "Quebrada Apinihua." Santa Rosa de Laulate lies close to the position deduced above for Santa Rosa based on Alfonso's report of its topography. Quebradas Lagarto and Apinihua enter the Ucayali from the east about the right distance downriver. The current mouth of Quebrada Lagarto is at the position deduced above for the Olallas' camp. The Apinihua is farther downriver, rather than a short distance upriver, as in Alfonso's description. The location of Apinahua Centro suggests that the Apinihua might have changed its mouth in the past decades, so it is possible that the two "creeks" were closer in the Olallas' time. The reversed locations of the two creeks in Alfonso's description are perhaps related to a problem with the location of the Ucayali itself (see below).

The Map of Hispanic America (sheet SC-18, 1938) shows a village named Santa Rosa about 5 km north of the mouth of the Urubamba, close to the presumed location identified above. This map shows the Ucayali flowing almost due west at this point, an unlikely possibility. There is no locality named Lagarto along the upper Ucayali on this map. There seems to be no trace of the town of San Pablo, mentioned by Alfonso on the island opposite his camp at Lagarto. Perhaps it has disappeared entirely, a fate not improbable for a small town on an island in Amazonia.

The descriptions of the course of the Ucayali in Alfonso's reports do not correspond to the river's likely course during his visits. At Santa Rosa he described the river both east and west of the camp and an island to the north. Currently, at the presumed location of Santa Rosa, just above the hills that reach the river, the Ucayali flows more or less northwestward through a cluster of large islands. The channel through these islands might well have changed since the 1920s, but it is not clear how the river could have been west of camp as well as east at this location. At the presumed location of Lagarto between the two eastern tributaries, the Ucayali again flows approximately northwestward, so it is not clear how the river could lie north of camp.

There are two possible explanations for Alfonso's problematic descriptions of the course of the Ucayali: either the locations of Santa Rosa and Lagarto deduced above are wrong or Alfonso was confused about the orientation of the river. Satellite images show no alternatives to the proposed locations for these two sites. The nearest loop of the Ucayali flowing eastward, which would provide a location on the eastern bank with the Ucayali to the north, is at least twice as far downriver, well beyond any reasonable distance for three or four hours' travel by canoe and well beyond the current place names. As Alfonso noted, there are no hills east of the Ucayali until far downriver beyond Contamana. Even west of the Ucayali the only hills approaching the bank of the river are the ones noted above.

Because there are no plausible alternatives for Santa Rosa and Lagarto, it seems more likely that Alfonso confused the directions to the river in his reports. If he inadvertently switched "north" and "south" in his description of Lagarto, the directions to the two creeks would probably also have been switched. If so, the reversed locations of Lagarto and Apinihua creeks would be explained. Even today local people make no use of compasses and refer to the cardinal directions in a general sense only. Adding to the difficulty of distinguishing north and south, at the season when Alfonso worked at these sites, the sun would have been nearly overhead at noon.

Alfonso's reports stated that temperatures were recorded at Santa Rosa from 12 November 1927 through 7 January 1928 and at Lagarto from 8 January through 7

March and again from 8 March through 31 March 1928. We examined 734 specimens from Santa Rosa and the same number from Lagarto in the AMNH Department of Ornithology (table 2). The specimens from Santa Rosa had dates between 12 November 1927 and 10 January 1928, except one *Lepidothrix coronata exquisitor* on 2 November 1927 (perhaps an error for 2 December). The specimens we examined from Lagarto had dates between 11 January and 31 March 1928. Alfonso's report indicated that he had taken advantage of a passing launch to ship specimens to Iquitos on 11 March. His notebook in the archives of the Department of Ornithology includes temperatures to that date, and his translated report in the Department of Mammalogy summarizes the temperatures for the remainder of March.

Alfonso's report covering the final weeks at Lagarto leaves it uncertain whether he ever began work on the route to the Gran Pajonal. It states that he awaited supplies to continue this work ("para seguir viaje al Pajonal"). His letter to Chapman after his return to Iquitos indicated that the brothers had gone to some expense ("los pagos que hicimos") in anticipation of opening trails ("nos anticipamos en hacerlos [caminos]") into the mountains to the west, as Chapman had earlier requested. It is thus not clear that the trail to the Gran Pajonal was actually begun, although the brothers had apparently incurred expenses in anticipation of this work. It remains possible that Alfonso spent some time on the western side of the Ucayali during this time, but the tenor of his reports does not suggest that he made collections there.

Teffe

Alfonso submitted a report on the work at Teffe (now Tefé), currently present in translation in the archives of the Department of Ornithology. As discussed earlier, Alfonso never visited Tefé and must have prepared this report from Ramón's notes. The report only summarized temperatures for the dates 10–25 July 1928. According to dates on specimens, collecting took place from 10 to 23 July at "Boca Lago Teffe" and then from 25 July to 14 August from "Santo Isidoro Teffe." These dates agree with those in Alfonso's report in the Department of Mammalogy, discussed above.

Alfonso's description of activities for the first period stated that the base for collecting activities was the town of "Teffe." The terrain he described corresponds with the current location of the town, just inside the mouth of the channel connecting the lake to the Solimões on the southern bank of the lake with high ground to the south. No mention is made of Santa Isidoro, the location on labels from the second period. Alfonso's report of his activities from June through August in the Department of Mammalogy, however, describes Santo Isidoro as a neighboring community ("colindando con el mismo Teffé").

In their gazetteer for Brazil, Paynter and Traylor cited Zimmer (1931: 9) for the locality Santo Isidoro, but stated that the collector and date were unknown and the locality "not located." They suggested that Zimmer might have misspelled the name. In fact, Zimmer had spelled the locality correctly and Ramón Olalla collected many specimens there.

The Map of Hispanic America (sheet SA-20 dated 1930) shows a village named "Sitio Isidoro" about 8 km east of "Teffé," on the southern bank of the Solimões just outside the mouth of the channel leading to the lake. Searches on the Internet revealed that there is currently a "comunidade San Isidoro" in the municipality of Tefé, although there is no information available about its exact location. The channels and islands in the Solimões at the mouth of the Río Tefé might have changed since the 1920s, so the town of Santo Isidoro might also have moved. Nevertheless, it is almost certain that at the time of the Olallas' visit Santo Isidoro was on the southern side of the Solimões adjoining Tefé itself.

Google Earth has 03°20′45″S, 64°42′30″W for Tefé. Santo Isidoro was probably within 10 km to the east or southeast. The coordinates provided by Paynter and Traylor in their listing for Santo Isidoro are presumably intended to be for Tefé itself, as they could not locate Santo Isidoro, and are close to Google Earth's coordinates for Tefé.

Santo Isidoro was possibly about 12 km SE at 03°24′08″S, 64°36′42″W.

DISTRIBUTIONS OF BIRDS IN AMAZONIAN PERU

Introduction

One reason that ornithologists have on occasion doubted the Olallas' localities is the unexpected distributions indicated by some of their specimens. The information presented so far has suggested that the Olallas themselves were aware of the faunal differences encountered on opposite sides of major rivers and indeed might be credited with bringing this phenomenon to Chapman's attention. Nevertheless, some of their specimens do not conform to our current notions of bird and mammal distributions in eastern Peru. Furthermore, some specimens are labeled from sites hundreds of kilometers from the nearest locations at which the species are otherwise known to occur. The following sections discuss the limitations of species and subspecies by major rivers in relation to the Olallas' collections.

Before proceeding, however, it is well to emphasize that we are still a way from understanding the details of the distributions of birds and mammals in Amazonia. There is always the possibility that new information can change expectations. A striking example is the recent confirmation that *Leucopternis melanops* occurs on the Río Tapajós, close to the location at which Alfonso Olalla collected a specimen in 1936 on the "wrong" side of the Amazon (Barlow et al., 2001, Raposo de Amaral et al., 2007). It is also now known that *Mitu tuberosum* occurs north of the Amazon near the location at which the Olallas collected a specimen on the Río Negro (Scheuerman, 1977). It is also well to remember that few, if any, modern ornithologists have spent as much time in Amazonia as Alfonso Olalla and that nobody has ever collected so many Amazonian specimens. Encounters with a few vagrants or outlying populations, even a few dozen, constitute no more than a tiny proportion of his collections.

In this list and the following ones, the Olallas' locations are abbreviated with two-letter codes and listed from north to south and east to west in Peru:

LC, Boca Lagarto Cocha;

CU, Boca Río Curaray;

IN, Puerto Indiana;

AP, Apayacu;

OR, Orosa;

SAA, SAB, SAC, and SAD, the four stages of investigation near Sarayacu;

LA, Lagarto;

SR, Santa Rosa;

UR, Boca Río Urubamba;

LT, Boca Lago Tefé;

SI, Santo Isidoro Tefé.

Recall that these localities lie along the Río Napo (LC, CU), on the northern side of the Río Amazonas (IN, AP), on the southern side of the Amazonas (OR), on the eastern side of the overall course of the Río Ucayali (SAA, SAD, LA), on the western side of the Ucayali (SAC), on both sides of the Ucayali (SAB), between the ríos Tambo and Urubamba at the origin of the Ucayali (UR), and on the southern side of the Solimões (continuation of the Amazonas in Brazil) (LT, SI). For each locality, I list the numbers of male (♂), female (♀), and unsexed or unknown (?) specimens collected by the Olallas.

Distributions Confirmed by the Olallas' Collections

The following systematic list includes species whose ranges (or whose subspecies' ranges) are now thought to reach limits in northeastern Peru (or to vary geographically there) and for which all the Olallas' specimens are in agreement with current understanding of their distributions. Subsequent lists include those species for which some of the Olallas specimens do not match current understanding or for which their specimens raise interesting questions about distributions. The present list shows that a large proportion of the Olallas' specimens confirm current understanding of distributions.

Leucopternis melanops (CU 1♀).

Leucopternis kuhli (UR 2♀). Replaces *melanops* south of the Amazonas in Peru.

Nothocrax urumutum (LC 1♂ 1♀, AP 1♂). Only north of the Amazonas.

Crax [Mitu] salvini (CU 3♂ 1♀).

Crax [Mitu]mitu [tuberosum] (OR 1♂ 1♀, SAB 1♀, SR 1♂, UR 2♂ 2♀). Replaces *salvini* south of the Amazonas in most of Loreto and north of the Amazonas in easternmost Loreto near the Río Putumayo (Scheuerman, 1977).

Odontophorus gujanensis (*buckleyi*, LC 1♂, CU 5♂ 3♀, IN 1♂ 1♀).

Odontophorus stellatus (OR 5♂ 7♀, SAD 1♀, LA 3♂ 2♀, UR 3♂ 1♀). Replaces *gujanensis* south of the Amazonas and Marañon.

Psophia crepitans (*napensis*, LC 1♂ 1♀, CU 2♂ 3♀, IN 1♂).

Psophia leucoptera (LT 1♂, OR 2♂ 4♀, SAA 1♂ 2♀, SAB 1♂, UR 1♂ 5♀). Replaces *crepitans* south of the Amazonas.

Phaethornis bourcieri (*bourcieri*, CU 1♂, AP 1♂, IN 1♂).

Phaethornis philippii (SI 2♂ 5♀, LT 1♀, OR 3♂, LA 1♀). Replaces *bourcieri* south of the Amazonas (although the situation is more complicated along the Ucayali).

Galbalcyrhynchus leucotis (CU 1♂ 4♀, AP 3♀, OR 2♂ 2♀, SAA 1♂, SAD 1♂ 1♀).

Galbalcyrhynchus purusianus (LA 1♀). Replaces *leucotis* on the upper Ucayali.

Eubucco richardsoni (*richardsoni*, CU 10♂ 8♀, IN 1♀; *nigriceps*, AP 7♂ 2♀; *aurantiicollis*, OR 2♂ 1♀, SAD 3♂ 5♀, LA 3♂ 2♀, SR 2♂ 1♀). In this series there are distinct differences across the Amazonas and less consistent differences across the lower Napo. North of the Amazonas males have gray-blue napes, those to the south yellowish. Males from AP have the sides of the head entirely black, those south of the Amazonas have feathers in this area tipped with dark red, and those from CU vary between these extremes. Males from AP also have more extensive dark red on the lower breast than do those from CU.

Pteroglossus beauharnaesii (SI 1♂, OR 5♂ 4♀, SAA 2♂ 3♀, SAD 3♂, LA 1♂ 2♀, UR 2♂). Restricted to the southern side of the Amazonas and the eastern side of the Ucayali.

Philydor erythrocercum (*lyra*, OR 1♀, LA 1♂; *subfulvum*, LC 1♂ 1♀, CU 3♀, AP 2♂). This series shows a well-defined difference across the Amazonas, but there are too few specimens to document distributions in western Loreto (the AMNH includes one specimen of *subfulvum* from the mouth of the Río Santiago).

Automolus ochrolaemus (*turdinus*, CU 2♂ 1♀, AP 1♀, IN 1♂; *ochrolaemus*, SR 1♂). The specimen from Santa Rosa resembles two from San Martín and others from Junín southward.

Thamnophilus aethiops (*kapouni*, OR 1♀, UR 1♀). The female from OR resembles the female from the Urubamba and others from southeastern Peru.

Myrmotherula axillaris (*melaena*, CU 3♀, IN 11♂ 9♀, LT 2♂ 2♀, OR 1♂ 1♀, SAA 1♂, SAD 3♂ 4♀; *heterozyga*, SR 8♂ 5♀, UR 3♂). Females from all localities are similar. Males from CU, IN, OR, and Sarayacu are all similar, almost blackish below and thus lacking contrast between the sides and the black bib. Those from LT are slightly paler on the back and sides of the breast, so they approach *heterozyga* males, which are slate gray with a long contrasting bib.

Myrmotherula erythrura (*erythrura* CU 1♂ 4♀, AP 2♀, IN 1♀; *septentrionalis*, LT 3♀, SR 9♂ 6♀). Specimens from LT, all females, resemble those from SR, except one with an extensive chestnut patch like nominate males.

Myrmotherula menetriesii (*pallida*, LC 1♂ 2♀, CU 5♂ 1♀, AP 1♂ 1♀, IN 2♂ 1♀; *menetriesii*, SAD 2♂ 5♀, LA 1♂ 4♀, SR 10♂ 7♀, UR 3♂ 3♀). Females from all locations are similar, but male *menetriesii* have a narrow black bib that varies in extent without relation to locality.

Myrmotherula ornata (*saturata*, CU 8♂ 2♀ 2?; *atrogularis*, SR 1♂). The male from Santa Rosa resembles those from Curaray. There are no female *atrogularis* in this series.

Microrhopias quixensis (*quixensis*, CU 6♂ 2♀, IN 1♂ 1♀; *intercedens*, LC 1♂, OR 1♂ 1♀, SAD 1♂ 3♀). Males of the two subspecies are indistinguishable, so the *intercedens* at LC was assigned to the wrong subspecies. Females of the two subspecies differ distinctly.

Cercomacra cinerascens (*cinerascens*, CU 1♂ 1♀; *sclateri*, LA 3♂ 5♀, SR 3♂ 2♀, UR 1♂). Nominate males have plain wings (no spots on wing-coverts), and nominate females have smaller spots on wing-coverts than do female *sclateri*.

Cercomacra nigrescens (*fuscicauda*, IN 1♂, OR 2♂ 1♀, LA 4♂ 5♀, UR 1♂). The type of *aequatorialis*, a female from Sumaco Abajo, Ecuador, is slightly more orangish above and has a larger white patch on its back than the females from OR and LA.

Myrmoborus myotherinus (*napensis*, CU 1♂ 4♀, AP 1♀, IN 4♂ 1♀; *myotherinus*, SAD 1♂, LA 10♂ 5♀, SR 5♂ 1♀). Nominate females have brighter cinnamon breast and abdomen. Specimens from Pomara (dept. Amazonas) resemble those from SR and LA.

Myrmeciza atrothorax (*tenebrosa*, IN 2♂; *obscurata*, SAA 1♂, LA 2♂, 3♀). The males from IN

are slightly darker than those from Sarayacu or LA.

Myrmeciza hemimelaena (*hemimelaena*, OR 1♀, LA 7♂ 5♀, SR 2♂, UR 1♂ 1♀). Males and females in this series have more white below than do specimens from farther south.

Pithys albifrons (*peruviana*, CU 1♂, SR 2♂). These specimens resemble males from Ecuador and Brazil (including the type of *brevibarba*). Crown and throat plumes vary in length regardless of location (although 4 of 5 males from San Martín have longer plumes than any others). In Loreto this species only occurs north of the Amazonas.

Gymnopithys leucaspis (*castanea*, CU 2♂ 1♀). No specimens of *peruana* collected by the Olallas, although the American Museum has specimens from Chamicuros, Chyavitas, and Jeberos (also spelled Xeberos) in western Loreto.

Formicarius analis (*zamorae*, CU 3♂ 2♀, AP 3♂, IN 1♂ 1♀; analis, OR 1♂ 1♀, LA 2♂ 3♀, SR 1♀, UR 2♂ 1♀). Specimens from south of the Amazonas have some whitish on the abdomen; those from the north have abdomens all gray. One specimen from CU has a pale gray lower abdomen, intermediate between the two subspecies.

Chamaeza nobilis (*rubida*, LC 1♀, CU 3♂ 2♀, AP 1♀, SI 1♂; *nobilis*, OR 4♂ 3♀, SAD 1♂, UR 2♂). The southern subspecies is slightly less reddish above and has slightly more white on the abdomen.

Phoenicircus nigricollis (LC 2♂, CU 6♂ 1♀, AP 1♂, IN 2♂). Only north of the Amazonas.

Machaeropterus regulus (CU 1♀). The Olallas' only specimen of this widespread species.

Machaeropterus pyrocephalus (SR 3♂ 2♀). One of the males is in femalelike plumage, evidently an immature.

Chiroxiphia pareola (*napensis*, CU 1♂; *regina*, SI 1♀, OR 5♂ 1♀, SAD 1♂ 1♀). Females are all alike, but males north and south of the Amazonas differ in color of the crown.

Lepidothrix coronata (*coronata*, CU 14♂ 6♀ 1?, IN 7♂ 1♀ 1?, OR 10♂ 3♀, SAA 1♂ 1♀, SAD 1♀ 1?, LA 3♂ 2♀, UR 1♂ 1♀). Eight of the males have femalelike plumage (one with a few black feathers below). One bird labeled female with enlarged ovaries has male plumage. Specimens from all of these localities are similar in size and coloration, although a few males (about 1 in 20) have the crown slightly darker blue.

Lepidothrix coronata hoffmannsi (LT 1♀, SI 2♂). Another distinctive subspecies occurring not far east of Loreto. Males are black with yellowish abdomen and darker blue on the crown in comparison with nominate males from Orosa. Females are duller green than nominate females.

Pipra erythrocephala (*berlepschi*, LC 1♂, CU 14♂ 5♀, AP 7♂ 3♀, IN 7♂ 3♀). Four of the males have femalelike plumage, including one with enlarged testes.

Pipra rubrocapilla (LT 6♂ 1♀, SI 7♂ 1♀, OR 11♂ 4♀, SAA 1♀, SAD 2♂, LA 1♂). Four of the males have femalelike plumage, including two with red feathers on the head. Replaces *erythrocephala* south of the Amazonas.

Pipra filicauda (*filicauda*, CU 4♂ 5♀, PI 7♂, SAD 4♀). Sarayacu females are like those from Curaray. This species extends south of the Amazonas but not as far as the upper Ucayali.

Pipra fasciicauda (*purusiana*, LA 10♂ 1♀, SR 6♂ 1♀, UR 2♂). Males from the upper Ucayali lack the more extensive red below and other features of *saturata* from San Martín. The two specimens from the mouth of the Urubamba are erroneously identified as *filicauda* in the AMNH catalog. For more about them, see the discussion of Bassler's collection below.

Leptopogon superciliaris (*superciliaris*, CU 1♂).

Leptopogon amaurocephalus (*peruvianus*, SR 1♀, UR 2♀). These two species are similar except the top of the head is dark gray in *superciliaris*, dark brown in *amaurocephalus*. This species occurs at higher elevations and thus closer to the Andes than *superciliaris*.

Lanio fulvus (*peruvianus*, CU 1♂ 1♀, AP 1♂).

Lanio versicolor (*versicolor*, OR 1♂ 1♀, LA 1♂). Replaces *fulvus* south of the Amazonas.

Psarocolius angustifrons (*angustifrons*, LC 1♂ 1♀, CU 2♂ 3♀, IN 2♂ 1♀, SAA 3♂ 1♀; *alfredi*, LT 2♂ 2♀, UR 2♂ 4♀). All specimens of *alfredi* have yellowish faces and entirely yellowish bills. Nominate examples have dull olive faces and bills entirely black.

Accepted Distributions Challenged by the Olallas' Collections

The following list includes species for which one or more specimens in the Olallas' collections do not match (or extend) our current understanding of the distributions of populations in northeastern Peru. For each species I provide comments on the divergence from current understanding or suggestions for future attention.

Six specimens with labels from the mouth of the Río Urubamba are particularly problematic (*Pyrrhura melanura* [2♀] and *Momotus momota microstephanus* [1♀], *Philydor erythrocercum subflavum* [1♂], and *Thamnomanes caesius glauca* [1♂ 1♀]). All were

acquired by the AMNH from Harvey Bassler. For completeness, these specimens are included in the following list, but discussion of them is deferred to the subsequent section on Bassler's collection.

Jacana jacana (*peruviana*, CU 3♂ 2♀, AP 1♀, IN 2♂, OR 3♂ 1♀, SA 5♂ 8♀). This series shows a cline in coloration from populations in eastern Ecuador (*scapularis*) where the upperparts are bright cinnamon brown southward to Sarayacu where the upperparts are dark chestnut. There seems to be no discontinuity at the Amazonas.

Geotrygon saphirina (*rothschildi*, CU 2♀, OR 5♂ 6♀). Specimens from OR resemble those from CU and Ecuador.

Geotrygon montana (OR 1♂, SAB 1♂ 1♀, LA 3♂ 2♀, UR 2♂ 1♀). There are also two specimens from CU in the Academy of Natural Sciences in Philadelphia purchased from the AMNH in 1928. Although elsewhere *saphirina* replaces *montana* at higher elevations, these two species evidently overlap widely on both sides of the Amazonas in northeastern Peru.

Pyrrhura melanura (CU 2♂ 1♀, AP 5♂, IN 1♀, LT 2♀, UR 2♀). All birds in this series are similar, except that specimens from the CU have wider and paler scalloping on the throat and breast (resembling 5 specimens from Ecuador). For the two specimens from UR, see the discussion of Bassler's collection.

Pyrrhura picta (SI 1♂, OR 7♂ 2♀, SAD 1♀). Joseph (2002) describes complex variation in this species and close relatives south of the Amazonas-Marañon from Yurimaguas to the Río Jurua. In this series the amount of scarlet on the forecrown varies without clear relation to locality. In addition, the extent of buff or brown on the auriculars varies in a similarly chaotic fashion. Replaces *melanura* south of the Amazonas in Loreto (but notice the overlap in Brazil near Tefé).

Pionites melanocephala (CU 2♂ 1♀, AP 7♂ 3♀, SAB 1♀, SAD 1♀, UR 1♂ 1♀). All alike. The specimen from SAD (on the eastern side of the Ucayali) indicates that this species is not limited by the Ucayali in this area.

Pionites leucogaster (OR 8♂ 2♀). In this series, six specimens have black flecks scattered on the crown, evidently young birds. There are no specimens in the AMNH from the Ucayali. Replaces *melanocephala* south of the Amazonas and east of the Ucayali.

Phaethornis superciliosus (*moorei*, CU 8♂ 2♀, AP 1♂ 1♀; *ucayali*, LA 5♂, SR 1♂ 3♀, UR 1♂). Males from the CU, like specimens from eastern Ecuador, have the breast and abdomen consistently less buffy than do specimens from farther south, without a clear difference across the Amazonas.

Thalurania furcata (*viridipectus*, CU 5♂ 3♀, IN 8♂ 6♀; *boliviana*, LA 1♂, SR 5♂, UR 2♂). This series provides no evidence for geographic variation. Specimens from north of the Amazonas are indistinguishable from those farther south.

Momotus momota (*microstephanus*, LC 1♂, CU 2♂ 3♀, AP 1♀, IN 1♂, UR 1♀; *ignobilis*, SAA 3♂ 3♀, SAB 4♂ 1♀, SAC 2♂ 1♀, LA 4♂ 3♀, SR 2♀, UR 3♂). All *microstephanus* are dull green below, whereas those of *ignobilis* have dull cinnamon underparts tinged to varying degrees with greenish on throat and flanks. Over half of the specimens from Sarayacu are intermediate in coloration, with breast and abdomen tinged green also, a suggestion of intergradation between the two forms. For the specimen of *microstephanus* from UR, see the discussion of Bassler's collection.

Galbula albirostris (*chalcocephala*, CU 1♂, AP 1♀, IN 3♂ 1♀, LA 2♂). The males from LA resemble those from IN.

Galbula cyanicollis (OR 7♂, SAD 5♂ 2♀). Replaces *albirostris* south of the Amazonas and east of the lower Ucayali, but *albirostris* apparently crosses the upper Ucayali at LA.

Galbula tombacea (CU 5♂ 1♀, AP 1♂ 2♀, IN 4♂ 6♀, SAB 1♂, LA 2♂ 1♀). All three specimens from LA resemble those from farther north. They have dates before 10 March, when Alfonso sent many of his specimens to Iquitos.

Galbula cyanescens (OR 1♀, SAA 1♂, SAB 1♂, LA 5♂ 1♀, SR 4♂ 4♀, UR 1♂m 1♀). Replaces *tombacea* south of the Amazonas, but these two similar species evidently have more complex distributions on the upper Ucayali, with both present at LA. Five specimens of *cyanescens* from LA have dates after 11 March; the sixth is dated 7 March. All resemble those from the other localities in this series.

Capito niger [*auratus*] (*punctatus*, CU 8♂ 5♀, IN 5♂ 3♀, LA 3♂ 4♀, UR 1♂; *amazonicus*, LT 1♂ 1♀, SI 1♂ 1♀, OR 4♂ 1♀; *auratus*, AP 2♂ 3♀, SAA 4♂ 2♀, SAD 4♂ 3♀). In this large series, males and females from north of the Amazonas and west of the Napo and from the upper Ucayali lack red on throat and forecrown, in contrast with those from east of the Napo and south of the Amazonas, as described by Armenta et al. (2005). The examples from Sarayacu (all specimens come from dates on which the Olallas collected on the eastern side of the general course of the Ucayali) vary in the amount of red on throat and forecrown, and the specimen from UR is intermediate in this feature.

Pteroglossus flavirostris (*flavirostris*, CU 2♂ 2♀, AP 2♀, SAA 1♂ 2♀; *mariae*, SI 1♂, OR 4♂ 5♀, SAD 1♂, LA 1♂). Specimens from CU and AP have a long brown band on the lower bill, darker than this area on specimens from Ecuador. Those from Sarayacu and OR vary. Some have the lower bill mostly dark brown and others mostly pale brown. Immatures have extensive dusky at the base of the bill. Specimens from south of the Amazonas are thus variable, some resembling birds north of the Amazonas and others birds farther south.

Selenidura reinwardtii (LC 1♂ 2♀, CU 4♂ 2♀, IN 2♂ 1♀, SAA 2♂ 4♀, LA 1♂). These six specimens from Sarayacu (238005, 238006–238010) and one from LA (238947) have bills that closely match those from CU, with more than half pinkish brown (although these Sarayacu birds have duskier brown and more extensive black).

Selenidera langsdorffii (SI 1♂, LT 2♂ 1♀, OR 5♂ 3♀, SAA 2♂, SAD 1♂ 1♀, LA 1♂, SR 1♂ 2♀, UR 1♂ 1♀). These specimens from Sarayacu (238002–238003, 238006, 238011), LA (238948), and UR have bills that resemble those from OR, with varying amounts of greenish gray near the middle of the lower bill (varying from none to over half the length of the bill) and no pinkish or brown. This form replaces *reinwardtii* south of the Amazonas, but the situation along the Ucayali is more complicated. The two forms are identical except for coloration of the bill. They are often considered conspecific on the basis of an unusual specimen from Río Negro, west of Moyobamba, San Martín (AMNH 234528) (Meyer de Schauensee, 1966; Haffer, 1974), its upper bill about 60% dusky brown and its lower bill about 60% grayish horn. A specimen from nearby (Río Seco, AMNH 234529) has a bill much like those from Curaray except the lower bill is paler than usual. Neither of these two specimens from San Martín is clearly an intermediate nor a mixture of the colorations of the bills of the two widespread forms. The occurrence of typical examples of both forms at Sarayacu and at Lagarto suggests that overlap without hybridization might occur along the eastern side of the Ucayali.

Xiphorhynchus elegans (*ornatus*, CU 1♀, IN 1♂; *juruanus*, LT 1♂ 1♀, SI 2♂ 2♀, OR 3♀ 1♂, SAD 4♀ 1♂, LA 6♂ 4♀, SR 1♂ 4♀). The series from SR and LA indicate that the upper Ucayali is not a limitation for *juruanus*, as Aleixo (2004) also noted.

Xiphorhynchus ocellatus (*napensis*, LC 1♂, CU 4♂, IN 2♂ 1♀, AP 2♂ 1♀, LA 3♂ 1♀; *perplexus*, SI 1♂, SAD 3♂). In this series the two subspecies are indistinguishable.

Synallaxis rutilans (*amazonica*, OR; *caquetensis*, LC 1♀, IN 2♂ 1♀). The specimens from IN are intermediate in size between those from south of the ríos Amazonas and Marañon (including specimens in the AMNH from Tefé, Chamicuros, Chyavetas) and those farther north (including eastern Ecuador and the Río Negro), an indication that the Amazonas does not produce a distinct separation between the two forms.

Philydor erythrocercum (*subflavum*, UR 1♂). See the discussion of Bassler's collection.

Automolus infuscatus (*infuscatus*, LC 1♀, CU 2♀, AP 1♂, OR 2♂ 1♀, LA 1♂ 1♀, SR 3♂ 2♀, UR 1♂ 1♀). There is no variation with location in this series. In addition, this series is indistinguishable from two specimens of *purusianus* from the Río Purus, Brazil.

Thamnophilus schistaceus (*capitalis*, CU 3, AP 1, IN 8, SAB 2, SAD 7; *dubius*, LA 10, SR 5). All specimens from Sarayacu resemble those from north of the Amazonas and differ distinctly from the specimens from Lagarto and Santa Rosa.

Thamnomanes ardesiacus (*ardesiacus*, LC 1♂, CU 1♂ 2♀, IN 1♀, SAA 1♀, LA 2♀, SR 2♂ 1♀). The specimen from SAA resembles those from LA and SR and differs from *saturninus* from Sarayacu in having a shorter tail and bill and lacking white on the back.

Thamnomanes saturninus (*huallagae*, OR 7♂ 3♀, SAA 1♂, SAD 3♀). Replaces *ardesiacus* south of the Amazonas but not along the foothills of Andes, on the upper Ucayali, or in southeastern Peru. One female from Sarayacu (238169, 12 July 1927, small ovaries) has a short bill and tail and lacks white on the back but differs from *ardesiacus* in having its breast rich brown instead of gray brown. It thus combines characters of both this species and the preceding.

Thamnomanes caesius (*glaucus*, CU 3♂ 4♀, IN 2♂ 8♀, UR 1♂ 1♀; *persimilis*, LT 1♂ 2♀, SI 2♂ 2♀). The specimens from LT and SI, both males and females, are indistinguishable from the series from IN or from specimens in the AMNH from the ríos Madeira (9♀) or Tapajós (4♀). In Peru, however, the species does not occur south of the Amazonas. For the specimens from UR, see the discussion of Bassler's collection.

Thamnomanes schistogynus (*schistogynus*, SAD 1♀, LA 6♀, SR 1♀, UR 1♀). The Olallas' collections from Peru include no males. There are no *caesius* or *schistogynus* from OR.

Myrmotherula hauxwelli (*suffusa*, CU 3♂ 2♀, AP 1♀, IN 2♂ 1♀; *hauxwelli*, SI 1♀, SAD 1♂, LA 6♂ 6♀, SR 3♂). There are no clear distinctions among localities in this series. Females from CU

and IN average slightly darker below (in approximately half of random pairwise comparisons).

Myrmotherula longipennis (*zimmeri*, CU 2♂ 1♀, IN 1♂; *garbei*, AP 2♀, IN 2♂, LT 2♀, SI 1♂, SR 2♂, UR 2♂ 1♀). In this series males vary in the extent of the black bib (only the throat at one extreme to throat and breast with spots on the abdomen at the other) but without relation to locality. Females from CU and Ecuador differ from females from LT, SI, and UR in having a slightly grayer (less olive) dorsum and slightly darker cinnamon-buff underparts, but otherwise the intensity of cinnamon varies greatly without relation to locality.

Cercomacra serva (*serva*, CU 3♂ 1♀; *hypomelania*, OR 1♂, SR 3♂, 1♀). In this series the two subspecies are indistinguishable in coloration and size. Males vary, without relation to location, in darkness of plumage and in size of the tips on wing-coverts.

Hypocnemis cantator (*peruviana*, OR 1♂ 3♀, SAA 1♂, SAB 1♀, SAD 11♂ 9♀, LA 9♂ 5♀, UR 1♂ 1♀; *saturata*, LC 1♀, CU 7♂ 3♀, AP 1♂ 1♀, IN 9♂ 5♀). These large series from north and south of the Amazonas are indistinguishable by size or coloration.

Hypocnemoides maculicauda (*maculicauda*, SAD 2♀).

Hypocnemoides melanopogon (*occidentalis*, IN 6♀ 2♂, LA 1♀, UR 2♂). Specimens from LA and UR (the latter in Bassler's collection) match *maculicauda* from SAD. Identification at the AMNH erroneously assigned them to *melanopogon*. The two species differ in coloration of females and in the width of white tips on the rectrices.

Gymnopithys lunulatus (LA 1♀). This specimen is dated 24 March, after shipment of most of Alfonso's specimens from Lagarto to Iquitos. In the absence of indications that he collected on the other (western) side of the Ucayali during this period (see above), this specimen suggests that the species might cross the upper Ucayali.

Gymnopithys salvini (*maculata*, LT 2♀, SI 5♂ 1♀, OR 1♂, SAD 3♂, LA 1♂ 2♀, SR 1♂ 1♀). The specimens from SR indicate that this species extends across the upper Ucayali. The Olallas' collections thus indicate that this species and the preceding one might overlap on both sides of the upper Ucayali.

Rhegmatorhina melanostricta (*melanosticta*, LC 1♀; *purusiana*, LT 1♂, SI 1♀, UR 1♀). In this small sample, the female from LT resembles the one from LC, and both are slightly paler on the crown and underparts than the female from UR.

Myrmothera campanisona (*signata*, CU 1♂ 1♀; *minor*, OR 2♀, LA 4♂, SR 2♂, UR 1♀). The two subspecies are alike in coloration in this series; *minor* possibly averages larger (larger in 3 of 4 random comparisons).

Pipra [*Dixiphia*] *pipra* (*discolor*, CU 8♂, IN 3♂ 1♀, LA 2♂ 4♀; *microlopha*, OR 18♂ 4♀, SAD 1♀, UR 1♂ 1♀). Eight of the males have femalelike plumage including two with scattered black feathers below. The type of *discolor* is a male from IN. The females in this series are all similar. Males from LA tend to have longer white caps than those from north of the Amazonas (5 of 9 random comparisons), those from OR less so (4 of 15 comparisons). Other than this possible cline in the size of the cap, the males in this series are similar.

Mionectes oleagineus (*hauxwelli*, LC 1♀, CU 12♂ 4♀, AP 4♂ 1♀, IN 1♂ 1♀; *maynana*, OR 1♀, LA 1♂, SR 2♂). In this series the two subspecies are indistinguishable in coloration or size.

Corythopis torquata (*torquata*, CU 1♂, IN 1♀; *sarayacuensis*, OR 1♂ 2♀, UR 1♂). In this small series the two subspecies are indistinguishable.

Lophotriccus vitiosus (*affinis*, IN 1♂ 3♀, AP 1♂; *vitiosus*, LA 7♂ 3♀, SR 10♂ 3♀). In this series the subspecies are indistinguishable in coloration or size. The length of the males' crests varies regardless of location.

Terenotriccus erythrurus (*signatus*, CU 1♂ 1♀, IN 4♂; *brunneifrons*, OR 1♂ 2♀, SAD 1♂ 1♀, LA 4♂ 2♀, SR 1♀, UR 1♀). Specimens of *signatus* have crown and nape slightly grayer on average (in 3 of 5 random comparisons) but are otherwise inseparable from *brunneifrons*.

Rhytipterna simplex (*frederici*, CU 1♀, AP 1♂, IN 1♀; *intermedia*, SI 1♀, OR 1♀, SAD 1♀). The specimen from SAD is slightly browner on the breast, like specimens from SI, south of the Solimões (continuation of the Amazonas) in Brazil. The specimen from OR, however, resembles those from north of the Amazonas. This series thus suggests that the division between the two subspecies lies south of the Amazonas in Peru but coincides with it in Brazil.

Thryothorus coraya (LC 1♀, CU 4♂ 3♀, IN 6♂, SAC 1♂, SAD 1♂). The specimen from SAC has a malar with incomplete streaks, intermediate between *coraya* and *genibarbis*.

Thryothorus genibarbis (LA 2♂ 2♀, SR 1♂ 7♀). All these specimens were assigned to *coraya* at the AMNH. Unlike the specimens of *coraya* from CU, they have the center of the abdomen buff (instead of gray like the breast) and the malar stripe with a white streak over a narrow

black one (instead of solid black). Specimens from IN have the center of the abdomen either gray or buff (3 of 6) and thus are intermediate in their coloration below. On the upperparts, all these specimens have a dark brown crown grading into a chestnut back. It is now known that these two forms replace each other across the Amazonas in Peru. Had the Olallas collected these species at Orosa and Apayacu, where they occur commonly, this point would have become clear earlier.

Turdus albicollis (*berlepschi*, CU 1♂ 2♀, IN 1♀; *saturatus*, AP 2♂, OR 1♀). Geographic variation in this small series is unclear. The specimens from CU, IN, and OR are similar; those from AP have the abdomen slightly buffier.

Ramphocaenus melanurus (*badius*, LC 1♂; *duidae*, CU 1♀; *amazonum*, LT 2♂, LA 1♂ 1♀; *obscurus*, SR 2♂ 1♀). The specimens from LC and CU are slightly rufous on the sides of the neck. Otherwise, all of these specimens are similar in coloration and size.

Tachyphonus cristatus (*fallax*, LC 1♂ 1♀, CU 4♂ 1♀, LT 1♀, SI 2♂ 1♀, SAD 1♂). The male from SAD resembles those from CU, LT, and SI. Despite this specimen, this species is currently believed to occur only north of the Amazonas and Marañon in Peru, although it extends south of the Solimões (continuation of the Amazonas) in Brazil.

Tachyphonus rufiventer (SAC 1♂, SAD 2♂ 1♀, LA 2♂ 2♀, UR 1♀). This species replaces *cristatus* south of the Amazonas in Loreto (with the exception of the specimen of *cristatus* from SAD).

Tachyphonus surinamus (*napensis*, CU 3♂ 1♀, IN 1♂, OR 11♂ 5♀, LA 2♂ 1♀, SR 4♂). This species is included here for comparison with its congeners with distributions limited by the Amazonas. Specimens from all locations are similar.

Icterus [cayanensis] chrysocephalus (AP 3♂ 1♀, SAD 1♀). The specimen from SAD suggests that this species might cross the Ucayali.

Icterus cayanensis (*cayanensis*, SI 2♂, OR 1♀). With the exception of the previous specimen, this species replaces *chrysocephalus* south of the Amazonas and east of the Ucayali.

Limits of Distributions along the Río Ucayali

The following 14 species or subspecies are currently believed to have distributions limited by the Amazonas or Ucayali, although specimens in the Olallas' collections from the upper Ucayali provide exceptions. For two of the species (*Hypocnemoides melanopogon* and *Thryothorus coraya*), the exceptional specimens were misidentified at the AMNH, so they are not actually exceptions. For another (*Xiphorhynchus ocellatus napensis*), the specimens from the Ucayali cannot be reliably assigned to subspecies, so again they are not actually exceptions. The remaining 11 species include five collected in the same locality with the closely related congener thought to replace it across the Ucayali (*Galbula tombacea*, *Selenidera reinwardtii reinwardtii*, *Thamnomanes ardesiacus*, *Gymnopithys lunulatus*, and *Tachyphonus cristatus*).

These specimens do not match our current understanding of avian distributions along the Ucayali. Several considerations, however, suggest that the Olallas' specimens might justify some revisions in our understanding. Along the Amazonas in Loreto, recent ornithological collections agree completely with the Olallas' collections at Puerto Indiana, Orosa, and Apayacu. In contrast, there have been no recent ornithological investigations on both sides of the Ucayali to compare with the Olallas' collections. Furthermore, all the exceptional species in the Olallas' collections along the Ucayali occur commonly in varzea forest. Throughout its entire course the Ucayali meanders through a wide and complex floodplain, although the river itself is not as wide as the Amazonas. It is possible that avian distributions are not limited as clearly by the Ucayali as they are by the larger Amazonas, as suggested earlier by Aleixo (2006).

A case in point is the relationship of the two forms of *Selenidera* along the Ucayali and nearby. The two forms *langsdorfii* and *reinwardtii* have long been considered conspecific on the basis of two putative hybrids in the AMNH from the department of San Martín (Meyer de Schauensee, 1966; Haffer, 1974). A reexamination of these specimens, together with the Olallas' from the Ucayali, provides little evidence of hybridization. The San Martín specimens do not have bills intermediate between the parental forms (although one has an unusual bill), whereas those from Sarayacu and southward on the Ucayali show no signs of intergradation (one has a slightly unusual bill). In plumage and

vocalizations the two forms are indistinguishable. Only the coloration of the bill separates them. Although dried specimens lose some of the intensity of this coloration, they retain the pattern and hue accurately. The relationship of these forms where they meet along the Ucayali and in the valleys of San Martín needs more work. A number of other pairs of species have similar patterns of geographical replacement.

Pionites melanocephala (SAD). Two additional specimens of *melanocephala* labeled UR are in the Bassler collection. There are no *P. leucogaster* in the Olallas collections from the Ucayali.

Galbula albirostris (LA).

Galbula tombacea with *G. cyanescens* (LA).

Selenidura [reinwardtii] reinwardtii and *S. [reinwardtii] langsdorfii* (SAA and LA). See above.

Xiphorhynchus [elegans] juruanus (SR and LA).

Xiphorhynchus ocellatus napensis (LA). The subspecies *napensis* and *perplexus* are indistinguishable in the Olallas' series.

Thamnomanes ardesiacus (SAA with *T. saturninus* and LA).

Thamnomanes schistogynus (SR). There is a specimen of *T. caesius* from UR in the Bassler collection. Otherwise, the Olallas collected no *T. caesius* on the Ucayali.

Hypocnemoides melanopogon occidentalis (LA, UR). These specimens, misidentified in the AMNH, match *H. maculicauda maculicauda* from Sarayacu rather than *H. melanopogon* from Indiana (also see the Bassler collection below). In his discussion of *Hypocnemoides melanopogon*, Zimmer (1932a) noted the disjunct location of these specimens from LA and UR, but he had no further comment on them. At this early stage in his treatment of Amazonian forms, he failed to notice that these specimens had been misidentified.

Gymnopithys lunulatus with *G. salvini* (LA).

Gymnopithys salvini (SR).

Thryothorus coraya (SR, LA). These specimens, misidentified at the AMNH, match *T. genibarbis*.

Tachyphonus cristatus fallax with *T. rufiventer* (SAD).

Icterus [cayenensis] chrysocephalus (SAD).

Specimens in Harvey Bassler's Collection

The collections of the AMNH Department of Ornithology include 82 specimens with the Olallas' labels but acquired from Harvey Bassler. Bassler's collection included some 500 specimens of birds (catalog nos. 406812–407313) along with some 10,000 specimens in the Department of Herpetology and ethnographic material in the Department of Anthropology.

Bassler was a petroleum geologist employed by Standard Oil of New Jersey during 1921–1931 to explore Amazonian Peru (Bradford, 1966). Based in Iquitos, he traveled widely along the Río Marañon as far as the department of Amazonas, along the Río Huallaga and its tributaries into the department of San Martín, along the entire course of the Ucayali and many of its tributaries, including the Río Tapiche, and up the Río Urubamba and its tributary the Río Inuya.

In 1933–1934, shortly after his return to the United States, he transferred most of his large collection to the AMNH in exchange for the cost of packing and shipping it from Peru and for access to the collections for study. According to an unpublished obituary written by Charles Bogert, curator of reptiles and amphibians, Bassler was appointed a Research Associate in that department. He died in an automobile accident in Pennsylvania in 1950. In his will, he conveyed his large library on South America and a large collection of fossils to his alma mater, Lehigh University. The archives of the AMNH Department of Ornithology has a copy of the obituary, but, aside from entries in the catalog, has no other documentation about Bassler's collection of birds.

Bassler acquired material from a diversity of collectors, both during his own extensive travels and also while in Iquitos. At least eight collectors are named on the labels of his birds. Many specimens came from José Schunke, including most of the amphibians and reptiles. One of Alfonso Olalla's letters to Chapman had recommended Schunke as a collector of amphibians and reptiles, a proposal that Chapman seems to have ignored. Nevertheless, no more than a decade later, Schunke's specimens came to the museum through Bassler's efforts. Other collectors that provided birds to Bassler included G. Tessmann, evidently in Peru to collect information for his pioneering work on the indigenous populations of northeastern Peru. Another notable collector was B.

Mendo, evidently a local person, who collected along the Río Mazan near Iquitos.

The specimens in Bassler's collections usually have the collectors' own labels, sometimes with annotations or additions on the same or additional labels. A few have no collector indicated and some have no data at all. Schunke's labels written in ink in small German script provide standard information about location, sex, age, and coloration of soft parts. Mendo's labels have less information. Most of the specimens in Bassler's collection have a number in ink on the back, presumably added by Bassler. Many also have the name of the collector added by Bassler. They are all stamped "Bassler coll." on the back, presumably when acquired by the AMNH.

The specimens with the Olallas' labels are all neatly prepared like the ones sent directly to the AMNH from Peru. Nine have the location "Rio Napo?"; eight, "Rio Tapiche"; 16, "Upper Amazon"; and the remaining 49, "Boca Río Urubamba." These localities are associated with different notations by Bassler about the collector. Those from the first two localities are usually annotated simply "Olalla" (once "Alfonso Olalla" and once "Olalla Brothers"), those from "Upper Amazon" have "Alfonso Olalla" (once simply "Olalla"), and those from the Urubamba have "Olalla Brothers" (except three "Alfonso Olalla"). Because of their similar annotations, specimens from each locality were probably acquired by Bassler in a single batch. Those from the first three localities have labels prepared presumably by Bassler, with locality, collector's name, and a number. The specimens labeled by Bassler "Rio Tapiche," all widespread species, could easily have been obtained by one of the Olallas during a stop at the mouth of this river on one of their trips between Sarayacu and Iquitos. Only the speciemens from the Urubamba carry the Olallas' usual labels, with a number and the collector added on the back presumably by Bassler.

Probably the two brothers sold several batches of specimens to Bassler at times when they had run short of funds from Chapman. Because most of the specimens represent widespread common species, the Olallas evidently sold Bassler specimens that they thought Chapman would find less interesting. Nevertheless, transferring specimens to Bassler would have violated the stipulation in the Olallas' contract to send all material to the AMNH. On the other hand, the difficulties of communication between Iquitos and New York, the brothers' recurrent shortages of funds, and their unexpected expenses for medical care and for transportation back and forth from the upper Ucayali would mitigate any accusations of misbehavior.

The specimens in Bassler's collection from "Boca Río Urubamba" present additional problems. Most obvious is the inclusion of representatives of populations not known to occur as far south as the upper Ucayali: *Pyrrhura melanura* (1♂ 1♀), *Pionites melanocephalus* (1♂ 1♀), *Momotus momota microstephanus* (1♀), *Philydor erythrocercum subflavum* (1♂), *Thamnomanes caesius glaucus* (1♂ 1♀), and *Hypocnemoides melanopogon* (2♂). It is possible that *Pionites melanocephalus* occurs west of the Ucayali as far south as the Urubamba as well as at Sarayacu (see above). The two specimens of *Hypocnemoides* from the upper Ucayali, as noted above, actually represent *maculicauda*, the species south of the Amazonas. The remaining six specimens of three species present more serious problems.

Almost all of the species and subspecies acquired by Bassler from the Olallas are numerous around Iquitos, including the three problematic species. Perhaps those labeled "Boca Río Urubamba" actually came from near Iquitos. The brothers made repeated trips to Iquitos to replenish supplies, to recover their health, and to await funds from the AMNH. It seems likely that Bassler might have proposed to buy some of their specimens to tide them over until funds arrived from New York. On the other hand, not all specimens acquired from the Olallas and labeled "Boca Río Urubamba" could have come from Iquitos. These include the two *Hypocnemoides* identified at the AMNH as *melanopogon* (a northern form) that are actually *maculicauda* (the southern form). Other southern forms include two male *Pipra fasciicauda purusiana* typical of populations on the upper Ucayali (also discussed above), two male *Myrmotherula axillaris suffusa*, and male and female *Myrmoborus myotherinus myotherinus*.

Because some of Bassler's specimens labeled "Boca Río Urubamba" are southern forms, it is possible that the problematic specimens are not actually out of place but instead represent northern populations that extend southward along the Ucayali. Such a distribution is known for *Thamnomanes ardesiacus*, which occurs with and apparently hybridizes with *T. saturninus* near Sarayacu and also occurs at Lagarto (see above) and in southeastern Peru (Schulenberg et al., 2007). *Thamnomanes caesius glaucus* occurs south of the Marañon to the west of the Río Huallaga and from there to the vicinity of Sarayacu but is not known from farther south (Schulenberg et al., 2007). Specimens of *Momotus momota* from Sarayacu appear to be intermediate between the northern and southern subspecies (*microstephanus* and *ignobilis*) (see above), but the Olallas' collections sent directly to the AMNH from the mouth of the Urubamba, unlike those in Bassler's collection, include only *Momotus momota ignobilis*, the expected southern form. No populations of *Pyrrhura melanura* or *Philydor erythrocercum subflava* are known anywhere south of the Amazonas and Marañon in Peru. Apparently the birds in Bassler's collection from the mouth of the Urubamba are a mix of unexpected and nearly impossible specimens.

A clue to a solution for these problems comes from the two specimens of *Thamnomanes caesius glaucus* (1♂, 1♀) that have labels with incomplete data. The labels are like others from "Boca Río Urubamba," except the proximal corners have not been trimmed and the only information other than the locality is "♂G." The Olallas otherwise always wrote "M.G." to indicate a male with enlarged testes. The accession numbers (432431–432432), on separate labels, are later than the rest of Bassler's collection, but "OLALLA BROS." is written on the back of the original label as on other specimens in his collection labeled "Boca Río Urubamba." This set of irregularities strongly suggests that at least some of the specimens in Bassler's collection were not part of the Olallas' regular collections.

Possibly some of these skins were sold to Bassler by Alfonso during his interlude at Iquitos before joining Ramón at the mouth of the Urubamba. Perhaps he collected them near Iquitos at this time and left them with Bassler with the labels incomplete. Subsequently, Ramón after his early return from the upper Ucayali to cure his recurrent malaria might have finished the labels at Bassler's request. Previously unaware of these specimens, he might well have been confused about their provenance, even without the complication of his illness, and thus assumed an incorrect locality. Perhaps he brought the specimens of the southern forms with him to Iquitos or collected them en route. Even if the erroneous location can be explained this way, the varied dates on the labels with the erroneous location must have been fabricated.

Zimmer evidently recognized the errors on these labels. As discussed in the list below, he ignored the specimens of *Philydor erythrocercum subflavum* and *Thamnomanes caesius glaucus* from "Boca Río Urubamba." He noticed but did not correct the discrepancy produced by the incorrect identification of two *Hypocnemoides melanopogon* (see the preceding list). Zimmer never got around to reviewing *Pionites*, *Pyrrhura*, or *Momotus*, so we do not know his position on the problematic specimens in these genera.

In summary, the following six specimens almost certainly have incorrect information on their labels. Probably others in Bassler's collection from "Boca Río Urubamba" were also mislabeled.

Pyrrhura melanura (UR 2♀).

Momotus momota (*microstephanus*, UR 1♀). The Olallas also sent specimens of typical *Momotus momota ignobilis* from UR directly to the AMNH.

Philydor erythrocercum (*subflavum*, UR 1♂). This specimen is a close match to specimens of this subspecies obtained by the Olallas at CU (3♀), LC (1♂, 1♀), and AP (2♂). There are specimens of the distinctive southern subspecies *lyra* from OR (1♀) and LA (1♂). This is the specimen on which accusations of fraud were based (see above). It is not mentioned by Zimmer (1935), nor by Vaurie (1980).

Thamnomanes caesius (*glaucus*, UR 1♂ 1♀). There is also one typical female *T. schistogynus schistogynus* from UR (listed earlier) sent directly to the AMNH by the Olallas. Zimmer (1932b), in a detailed discussion of the distributions *T. glaucus* and *T. schistogynus* in Peru,

recognized the correct pattern of replacement across the Amazon, despite several old specimens from questionable localities. No doubt Chapman had mentioned the Olallas' evidence for limitations of avian distributions by large rivers in Amazonian Peru. Zimmer studiously doubted the provenance of an old specimen of *T. glaucus* from Sarayacu, but he indicated that some *T. schistogynus* from Sarayacu showed signs of intergradation with *T. glaucus* (compare with *Momotus momota* above). He nowhere mentions the specimens labeled "Boca Río Urubamba." As in the case of *Philydor erythrocercum subflavum*, he ignored these problematic specimens.

Primates in Amazonian Peru

The Olallas collected mammals as well as birds during their work for the AMNH. Their specimens in the Department of Mammalogy consist of prepared skins and associated skulls. I have not examined all of this material, but the primates in particular have relevance to the Olallas' collections of birds.

Primates have distributions in Amazonia with many parallels to the distributions of birds. In particular, distributions of primates are often limited by large rivers, and sets of congeners or subspecies often have distributions that are congruent with those of some birds. Northeastern Peru provides many examples, and the Olallas' specimens provided the basis for Hershkovitz's pioneering revisions of Amazonian primates that first made some of these patterns apparent. Contrary to Vaurie's statements in 1971 and 1972 (see above), Hershkovitz (1977) listed the Olallas' specimens without comment in his monograph of the Callitrichidae. Although his subsequent generic revisions (Hershkovitz, 1983, 1984, 1987, 1988, 1990) questioned the localities of certain specimens collected by the Olallas in Peru, he listed most of them without comment.

The Bassler collection also includes many primates collected in eastern Peru at about the same time the Olallas were active. These specimens fall into two categories. Those labeled "Iquitos" have labels prepared by Schunke in German or lack an original label altogether. Schunke sometimes included the name of a local collector on the label. The others appear to have been acquired by Bassler on his geological explorations on the ríos Napo, Amazonas (Pevas, Marupa), Tapiche, and Ucayali (Pampahermosa, Contamana) as far as the Río Inuya (a tributary of the Río Urubamba not far above its confluence with the Tambo). None of Bassler's primates has one of the Olallas' original labels. The specimens labeled "Iquitos" include some that cannot have come from there (*Saguinus fuscicollis illigeri*, *S. f. leucogenys*, *S. mystax*, $n = 6, 1, 1$ respectively). Schunke might have found them in the large market in Iquitos, or he might have brought them from elsewhere himself. In contrast, the specimens from localities visited on Bassler's own travels all accord with our current understanding of distributions. Hershkovitz (see references above) also questioned some specimens in Bassler's collection from the Río Tapiche and Río Inuya. Although Hershkovitz attributed specimens from these localities to the Olallas, they actually came from Bassler's own expeditions.

The following list shows that nearly all of the Olallas' and Bassler's specimens conform with current understanding of primate distributions. The Olallas' specimens from Sarayacu and the upper Ucayali are particularly informative in confirming Alfonso's reports about their activities there. The series of *Saguinus imperator* and *S. fuscicollis weddelli* from the upper Ucayali confirm that the two brothers actually worked at these places, despite Vaurie's accusations of duplicity. The series of *S. f. illigeri* and *S. f. nigrifrons* from Sarayacu fit expectations for populations east and west of the Ucayali, respectively, except for the two specimens of *illigeri* labelled 15 April, the day before collecting began on the west (see above). Perhaps Alfonso was off by a day. On the other hand, observations by Tom Struhsaker and myself in 1997 along the Río Tapiche suggest that the distributions of these forms in the complex floodplain of the Ucayali are not yet fully understood (Struhsaker et al., 1997).

Some series of primates collected by the Olallas were questioned by Hershkovitz (see references below), particularly *Pithecia* from Indiana and *Callicebus* and *Saimiri* along the Ucayali. Before doubting the localities on the

labels of these specimens, we need more study of variation in these populations. Distributions might be particularly complex along the upper Ucayali, with some overlapping or intergradation of different forms, as we have seen among birds. The specimens with locations questioned by Hershkovitz are noted in the list below.

One series of the Olallas' primates conflicts squarely with current understanding: the seven specimens of *Saguinus fuscicollis tripartitus* from Indiana. Each of these specimens has a different date between 31 May and 11 July 1926 (one specimen is missing its original label but has a catalog number in sequence with the others). At present this subspecies occurs primarily between the ríos Napo and Curaray in Ecuador and Peru. The replacement of *S. f. tripartitus* by *S. f. lagonotus* on the southern side of the Curaray is well known to local residents and confirmed by recent expeditions (Aquino and Encarnación, 1996, Heymann et al., 2002, Aquino et al. 2005, Devon Graham and myself, personal obs.). The Olallas also collected *lagonotus* at Indiana (Thorington, 1988), a form that still occurs in the area, in addition to the seven specimens of *tripartitus*.

The specimens of *tripartitus* from Indiana might have been brought down the Napo from the Curaray by Alfonso and Ramón themselves. An indictment of duplicity would not be straightforward, however. Notice that none of the Ollalas' other specimens of primates from Indiana diverge from current understanding. Their collections from Indiana included no *Saguinus nigricollis* or *S. mystax*, although it is more likely that these would have been offered for sale there because they occur close to Indiana across the Napo and the Amazonas respectively. Furthermore, if duplicity were motivated by a plan to augment the diversity of their offerings to the AMNH, *nigrocollis* and *mystax* would have been new additions to their collections. They had already collected a series of *tripartitus* at the Curaray.

Dismissal of these problematic specimens is complicated because the distribution of *tripartitus* and its relationships with other forms of *Saguinus fuscicollis* might not yet be completely understood. Contrary to most of our current information, there are two reports of *tripartitus* north of the Napo. One is a specimen labeled "Coca" collected by Hershkovitz (1977) on his first expedition to Ecuador. Hershkovitz later mentioned that he had failed to recognize the importance of the sides of rivers in his early days (Blake's letter to Vaurie in 1965, discussed earlier), so perhaps the label on this specimen should not imply a location on the northern side of the Napo. In his monograph of the Callitrichidae, he nevertheless mistakenly shows the range of *tripartitus* restricted to the northern side of the Napo. An additional report of *tripartitus* north of the Napo is an observation of two groups on the Río Yuvineto in northern Loreto in 1978 (Aquino and Encarnación, 1996; Heymann et al., 2002; F. Encarnación, personal commun.). Perhaps the Olallas discovered another population (possibly disjunct) of *tripartitus* sympatric with *lagonotus* near Indiana.

A disjunct population in the area of Indiana could conceivably have been started by people who brought animals down the Napo. *Saguinus fuscicollis* are often purchased as pets by travelers in Amazonia. Perhaps several animals escaped during the portage from the Napo to the Amazonas on the way to Iquitos. The resulting population might never have been large. Even if it once did exist, it is certainly extinct now, perhaps partly as a result of the Olallas' collecting.

One notable aspect of the Olallas' collections of primates is their documentation of many large species in areas from which they have long ago disappeared, in particular *Lagothrix lagotricha*, *Ateles paniscus*, and *Cacajao calvus*. It is unlikely that the Olallas precipitated these losses, but documentation of the former presence of these species indicates how easily they can be extirpated.

The following list includes all specimens in the AMNH from the departments of Loreto and Ucayali. The Olallas' series are listed first, with the same abbreviations for localities used in the lists of their birds. Bassler's specimens are listed last. The few remaining specimens are in the middle. Nomenclature follows Rylands and Mittermeier (2009). This list reveals that the distributional problems raised by the Olallas' specimens of primates often parallel similar problems among birds. In particular, distributions along the Ucayali

are more problematic than those along the Amazonas, perhaps because overlap and intergradation are more frequent there.

Cebuella pygmaea (CU 5♂ 2♀, AP 7♂ 5♀; SAA 2♂ 1♀; SAC 1♂; OR 4♀; lower Napo (N side) 2?, Bassler). In coloration these specimens are all similar. Hershkovitz (1977) identifies specimens from north of the Amazonas and Marañon as subspecies *pygmaea* and those to the south as subspecies *niveiventris*.

Callimico goeldi (IQ 1♀ 1?, Bassler; Contayo Tapiche 1♀, Bassler).

Saguinus nigricollis nigricollis (LC 1♀, CU 8♂ 7♀; AP 5♂ 8♀; Pevas 1♂ 1♀, Bassler).

Saguinus fuscicollis avilapiresi (LT 2♂).

Saguinus fuscicollis leucogenys (SR 2♂ 1♀; Samiria, 6?, 1912; IQ 1?, Bassler). Specimens from Samiria resemble *illigeri* from SAB below.

Saguinus fuscicollis lagonotus (CU 7♂ 7♀ 1?; IN 9♂ 7♀; Río Mazan 1♀, Bassler; IQ 1♂ Bassler).

Saguinus fuscicollis illigeri (SAA 2♂ 1♀; SAB 7♂ 7♀; IQ 2♂ 1♀ 3?, Bassler). The specimens from SAA are dated 15 April, the day before collecting began on both sides of the river, as explained above. Otherwise the *illigeri* from SAB could come from west of the Ucayali, and the *nigrifrons* (below) from SAA and SAC would come from east of the river. The distribution of these subspecies along the lower Río Ucayali is complex. Recent fieldwork found *illigeri* east of the Ucayali as far as the Río Tapiche above the Río Blanco (Struhsaker et al., 1997) and *nigrifrons* confined to the lower Tapiche below the Blanco (Hodun et al., 1981).

Saguinus fuscicollis nigrifrons (OR 8♂ 16♀; SAA 7♂ 5♀; SAC 2♂ 2?; Marupa 2♂ 2♀, Bassler).

Saguinus fuscicollis weddelli (simply *weddelli* on the labels) (LA 8♂ 4♀; UR 4♂ 2♀).

Saguinus tripartitus (CU 9♂ 7♀; IN 5♂ 1♀ 1?; IQ 1♂ 1♀, Bassler). See comments above on the specimens from IN. The specimens from CU could have come from either side of the Napo or Curaray. If they came from west of the Napo and north of the Curaray, they would agree with current understanding of the distribution of this species (see discussion above).

Saguinus mystax mystax (OR 8♂ 5♀; SAA 6♂ 7♀; LA 5♂ 3♀; Samiria 6; IQ 1♀, Bassler). The specimens from LA extend the range of this species on the eastern side of the Ucayali somewhat farther south than the Río Sheshea, the southern limit of this species reported by Aquino and Encarnación (1994). The specimens from Samiria and Iquitos are not within the currently recognized range of this form.

Saguinus mystax pileatus (LT 2♂ 1♀).

Saguinus imperator subgrisescens (no subspecies on the labels) (UR 6♂ 9♀; Río Inuya 1♂ 2♀, Bassler).

Saimiri boliviensis peruviensis.

Saimiri sciureus macrodon. Both species identified among specimens from Puerto Punga, Río Tapiche, and from SA. Distribution of these two forms along the Río Tapiche is complex (Struhsaker et al., 1997).

Cebus albifrons albifrons/cuscinus (*albifrons unicolor* on the labels) (LC 2♂; CU 5♂ 3♀; IN 3♂ 1♀; SAA 1♂ 1♀; SAB 1♂ 1♀; UR 5♂; Río Inuya 1♂ 1♀, Bassler; Samiria 1) The specimens from SAB, one from LA, UR, and one from Río Inuya have hindparts with cinnamon tinge (like one specimen from LC and CU each).

Cebus macrocephalus (*apella apella* on the labels) (CU 3♂; IN 2♀; OR 2♂; SAA 2♀; SAB 2♂; SAC 1♂; UR 2♂ 2♀ 1?; lower Napo (N side) 1, Bassler; IQ 2, Bassler; Samiria 4; Río Tapiche 2, Bassler; Contamana 1♂, Bassler; Río Inuya 1♂ 1♀, Bassler).

Aotus vociferans (LC 1♀; CU 5♂ 7♀; AP 1♀; IN 1♂ 3♀; IQ 3, Bassler). Hershkovitz (1983) identifies one specimen from IN as *nancymaae* and suggests the locality is erroneous.

Aotus nancymaae (OR 1♂ 2♀; SAB 1♂ 1♀; SAC 1♂ 2♀; Samiria 2; Marupa 1♂ 1♀, Bassler).

Aotus nigriceps (UR 3♂ 4♀; Pucallpa, 5; Pampahermosa 2♀, Bassler);

Callicebus cupreus/discolor (*cupreus discolor* on the labels) (LC 2♂; CU 4♂ 1♀; IN 6♂; LA 3♂; IQ 5, Bassler; lower Napo (N side) 1, Bassler; Río Tapiche 1, Bassler; Río Inuya, 1♂ 1♀, Bassler). According to Hershkovitz (1990), *C. cupreus discolor* and *C. cupreus cupreus* occur west and east of the Ucayali respectively. He doubts specimens of *discolor* identified among those from LA and Río Inuya, both east of the Ucayali and Urubamba. He also identifies specimens of *C. calligatus* from LA but doubts the locality (otherwise east of the Río Tapiche and the Peruvian border). He also doubts the locality of specimens he identifies as *C. brunneus* from UR and Río Inuya, although these localities are not far from the distribution of this form in southeastern Peru. The localities of these problematic specimens (Río Inuya, UR, LA) are no more than 60 km apart. Further study of variation in these specimens is needed to clarify the identifications. Hershkovitz (1990) also questions the locaties of specimens identified as *C. cupreus* from SA and UR.

Callicebus lucifer (*torquatus lucifer* on the labels) (LC 2♂; CU 2♂ 2♀; AP 3♂ 2♀; lower Napo (N side) 1, Bassler; Pevas 1♂ 1♀, Bassler). The specimens from CU could have come from either side of the Napo or Curaray.

Pithecia monachus monachus (LC 2♂; CU 7♂ 2♀; IN 1♂ 2♀, male possibly immature; OR 1♂ 2♀; SAA 4♂ 2♀; SAB 1♂; SAC 1♀; LA 1♂ 1♀; UR 2♂ 1♀; Río Inuya 2♂, Bassler; Río Tapiche, 2?, Bassler; Río Pisqui, 1♂, Bassler; IQ 1 juvenile, Bassler). Specimens from CU could have come from either side of the Napo or Curaray.

Pithecia aequitorialis (monachus aequitorialis on the labels) (IN 1♂; OR 1♀; IQ 2♀, Bassler, both with extensive cinnamon below). The female from OR lacks cinnamon below. It thus resembles female *monachus*, the form expected south of the Amazonas. The four specimens of *Pithecia* from IN need further study. Hershkovitz (1990) doubts the locality of these specimens. He identifies the immature male as a female *aequitorialis*. The two females are identifed as *monachus*, the form otherwise restricted to the southern side of the Amazonas. The adult male is clearly *aequatorialis*. Variation in the amount of cinnamon coloration on the ventral surface and resemblence of immature males and females require further study before these specimens can be properly identfied.

Cacajao calvus ucayalii (no subspecies on the labels) (OR 3♂ 2♀; SAA 2♂ 1♀; LA 3♂ 2♀; IQ 1♂ 1 juvenile, Bassler; Río Tapiche 1♂, Bassler; Río Inuya 1♂ 1♀, Bassler). Specimens from Sarayacu and Orosa are similar (evenly dark cinnamon); those from Río Inuya have paler upperparts; those from LA are intermediate. As Hershkovitz (1987) notes, all localities are east of the general course of the ríos Urubamba and Ucayali.

Alouatta seniculus. Does not extend southward to the upper Ucayali. *A. puruensis* occurs south of the Río Inuya perhaps (IUCN). *A. seniculus* is perhaps a junior synonym of *A. juara* (mapped together by IUCN).

Ateles chamek (*paniscus chamek* on the labels) (OR 2♂ 3♀; UR 2♂ 3♀; SAA 1♀; Río Inuya 1♂ 1♀, Bassler).

Ateles belzebuth (*paniscus belzebuth* on the labels) (CU 3♂ 5♀; IN 2♂ 3♀; IQ 1♂ 1♀ 1?, Bassler; Maralio, Río Napo 1♂, Bassler).

Lagothrix lagotricha (*lagotricha lagotricha* on the labels) (CU 2♂ 4♀; AP 3♂ 3♀). These specimens are tan with darker extremities (unlike the following, which are dark brown with blackish extremities).

Lagothrix peoppiggii (*lagotricha peoppiggii* on the labels) (LC 1♀; CU 4♂ 2♀; IN 2♂ 3♀; SAA 1♂ 5♀; UR 3♂; IQ 1♂, Bassler; lower Napo (N side) 2, Bassler; Río Pisqui 2, Bassler). Specimens from Curaray are darker than others.

Birds on River Islands

In Amazonia, some birds are now known to be confined mostly to large islands in major rivers (Remsen and Parker, 1983; Rosenberg, 1990), despite the occurrence of similar habitats on the banks of these rivers. Alfonso's report on activities at Orosa explicitly mentioned visits to islands. He mentioned camps on islands at the mouths of the ríos Curaray and Apayacu. At other locations islands were not mentioned in the descriptions of the areas for collecting, and the report on Lagarto stated that the nearby island was not visited.

The following list of species believed to be restricted to islands includes the numbers of specimens in the Olallas' collections from Peru. With a few exceptions there is little evidence that the brothers spent much time on islands, in general agreement with Alfonso's reports. The collections from the Curaray include the most island species. Those from Oroza and Apayacu include none. When Alfonso mentioned visiting the islands near Orosa, he must have had in mind the migrating shorebirds, particularly well represented from September and October at Orosa. These birds visit mud banks exposed by the falling river in late summer, often at the downstream ends of islands.

Some of these species are scarce, even on islands, but *Thamnophilus cryptoleucus* and *Myrmochanes hemileucus* occur reliably in the understory of forests on all major islands in the lower Napo and Amazonas. The absence of these species in their collections suggests that the brothers did not visit the interiors of large islands, at least along the Amazonas. On the other hand, their collections include many specimens of *Synallaxis propinqua* and *Myrmoborus lugubris*. If the brothers did visit islands, they must have collected selectively. Alternatively, the latter species might occur along river margins, in addition to their occurrence on islands, more often than now realized. *Picumnus castelnau*, collected by the Olallas only on the Ucayali, possibly occurs there along river margins.

Picumnus castelnau (SAA 2♂ 1♀, SR 1♂ 2♀, UR 1♂).

Xiphorhynchus kienerii. None.

Synallaxis propinqua (LC 2♂, 1♀, CU 7♂ 4♀, IN 5♂ 1♀, SR 1♀, UR 1♂ 2♀).
Cranioleuca vulpecula. None.
Thamnophilus cryptoleucus. None.
Myrmotherula assimilis (IN 1♂ 2♀, LT 4♂ 2♀).
Myrmoborus lugubris (CU 2♂ 3♀, IN 1♂ 1♀, SAA 1♂, SAB 2♂).
Myrmochanes hemileucus. None.
Elaenia pelzelni (CU 1♂ 1♀).
Serpophaga hypoleuca. None.
Stigmatura napensis napensis (CU 1♂, 2♀).
Knipolegus orinocensis. None.
Attila bolivianus (SAB 1♂).
Celeus spectabilis. None.
Conirostrum bicolor (*minor*, CU 2♀).
Conirostrum margaritae. None.

Birds of Andean Foothills

The Olallas' collections include a number of species whose ranges are, according to current understanding, restricted to the foothills of the Andes and thus are unexpected at locations in Amazonia such as the Olallas' locations in northeastern Peru. Nevertheless, all these specimens come from the three localities closest to the Andes, mostly from the Río Curaray and also from the mouth of the Río Urubamba and Santa Rosa.

In some cases we have recent evidence that these species actually occur in the hilly areas of northern Loreto far from the Andes: *Heliodoxa schreibersii*, *Thamnophilus aethiops aethiops*, *Poecilotriccus capitalis*, *Colonia colonus*, *Henicorhina leucosticta* (Vriesdendorp et al., 2007). We now know that *Heliodoxa schreibersii* and *Poecilotriccus capitalis* also occur even farther south along the Napo (Cardiff, 1983).

In two cases the foothills forms identified at the AMNH are indistinguishable from Amazonian forms, so the apparent discrepancy in distribution is best removed by reassignment to the Amazonian form (*Percnostola [Schistochlamys] leucostigma intensa*, *Sporophila luctuosa*).

One particularly interesting case is the series of *Lepidothrix coronata exquisitor* in the Olallas' collection from Santa Rosa. This subspecies from the slopes of the Andes is replaced by *coronata* in the Amazonian lowlands. As already noted, however, the presumed location of Santa Rosa lies near a range of hills extending from the easternmost Andes to the bank of the Ucayali, as described in Alfonso's report. Perhaps this distinctive subspecies occurs on or close to these hills.

The remaining species pose problems. In particular, the specimens of Andean species from the Curaray provide one of the primary sources of doubt about the Olallas' procedures. The Olallas had descended the Napo from the Andes to reach the Curaray, and most of the party accompanied Carlos back upriver to the Andes after three months at the Curaray. Specimens from the Andes might have been transferred to the collections from the Curaray on either occasion. The number of specimens of foothills species in the Curaray collections is large enough that we have to suppose either confusion by the Ollalas' on a large scale or systematic deception. The original accusations about the Olallas' collections clearly raised the latter possibility. The motive for such deception would presumably be to provide a more varied collection from any one place, by mixing specimens from different places.

The specimens listed below have labels with dates scattered throughout October, November, and December 1925. Although they might have been added to Carlos' shipments after his return from Quito, there is no mention of such specimens in any of his correspondence or in the catalogs of the Department of Ornithology. Instead Alfonso's accounts state that the specimens from the Curaray were shipped from Iquitos in January just before most of the party departed upriver. Because of the shortage of critical supplies, relatively few specimens were collected by the two brothers in the following months before they moved to Indiana. The specimens collected in Ecuador while preparing for the descent of the Napo were sent back to Quito with Rosalino who returned there when the others headed downriver. In other words, Alfonso's accounts, the correspondence from Quito, and the AMNH catalogs provide a coherent account of the provenance of the specimens from the Curaray.

There is another point that goes against accusations of systematic deception. Most of the species involved are rare even in the

foothills of Ecuador. As noted below, they include species that the Olallas never collected in Ecuador. Augmenting the collection from the Curaray by subtracting from their collections in Ecuador does not constitute a gain in the diversity of their shipments to New York.

In the Olallas' large collection from the mouth of the Curaray, each of the species below is represented by only one or a few specimens. Further information from northern Loreto would clarify their status there.

Tinamus tao (UR, 1♂).

Megascops guatemalae (*napensis*, CU 1♂). 15 October 1925, enlarged testes.

Eutoxeres aquila (CU 1♀). 23 October 1925.

Eutoxeres condamini (CU 1♂). 30 October 1925. Testes enlarged.

Heliodoxa schreibersii (CU 1♀). 16 November 1925. Recently reported from elsewhere in northern Loreto (Río Arabela, Vriesendorp et al., 2007) as well as farther down the Napo (south of the Napo at 3°00′ and south of the Río Mazán at 3°33′S) (Cardiff, 1983, and personal recordings).

Colibri delphinae (CU 1♂).

Taphrospilus hypostictus (*hypostictus*, CU 3♂ 1♀).

Synallaxis moesta brunneicaudalis (CU 2♀).

Anabazenops dorsalis (CU 1♂). Enlarged testes.

Xenops rutilans (*peruvianus*, UR 1♀).

Thamnophilus aethiops (*aethiops*, CU 2♂). Both with enlarged testes. Recently reported from northern Loreto (Río Arabela, Vriesendorp et al., 2007).

Myrmotherula sunensis (CU 2♂). 27 and 30 October.

Herpsilochmus rufimarginatus (*frater*, CU 1♂). 6 December.

Drymophila devillei (*devillei*, CU 1♂, LA 1). The specimen from CU is dated 6 December.

Percnostola [*Schistoclamys*] *leucostigma* (*intensa*, SR 2♀). Females of the subspecies *intensa* and *subplumbea* are indistinguishable. Because of the proximity of foothills to Santa Rosa, these specimens might come either from populations along the foothills (*intensa*) or from the lowlands (*subplumbea*).

Lepidothrix coronata (*exquisitor*, SR 3♂ 3♀). This distinctive subspecies of the Andean slopes evidently occurs in the hills that nearly reach the Ucayali near Santa Rosa.

Chloropipo holochlora (CU 3♀). Two dated 27 October and one 2 November 1925.

Poecilotriccus capitalis (CU 4♂ 2♀). Dated 26 October through 27 November. Three of the males have femalelike plumage, including two with a few black feathers above. The species is now known to occur sparsely in northern Loreto (Vriesendorp et al., 2007) and south to the Río Sucusari (Cardiff, 1983, also personal observations and recordings).

Myiobius villosus (*clarus*, CU 1♀).

Myiophobus cryptoxanthus (CU 1♀). 18 November 1925. This specimen resembles others from Ecuador.

Colonia colonus (*fuscicapilla*, CU 2♂ 3♀). This series resembles birds from eastern Ecuador. Now confirmed in northern Loreto (Vriesendorp et al., 2007).

Henicorhina leucosticta (*hauxwelli*, LC 1♂, CU 1♂ 4♀). Occurs sparsely in northern Loreto (Vriesendorp et al., 2007).

Microcerculus bambla (CU 2♂).

Sporophila luctuosa (CU 1♀, LA 1♂ 1♀, UR 1♀). The female from the mouth of the Curaray is similar to female *bouvronides*, to which it is best assigned.

Arremon aurantiirostris (*spectabilis*, CU 5♂ 3♀).

Tangara cyanicollis (*caeruleocephala*, CU 4♂). Like specimens from Ecuador and San Martín.

A few additional specimens collected by the Olallas are from localities beyond the species' currently known ranges, although they are not specifically associated with the Andean foothills:

Megastictus margaritatus (LC 1, CU 2, PI 2, LA 15). Otherwise unknown from the upper Ucayali, this species has a patchy distribution in Loreto, evidently associated with nutrient-poor soils.

Conopophaga aurita (*australis*, CU 2♂ 1♀, SI 2♂, UR 1♂). The specimen from UR resembles those from CU except black extends from the throat to the upper breast and the cinnamon band across the breast is narrower. Recently confirmed to occur south to the mouth of the Urubamba (T. Schulenberg, personal commun.).

Heterocercus linteatus (IN 1♀). This specimen is darker than most *linteatus* and thus resembles female *aurantiivertex*, to which it is best assigned.

Migrant Birds

Boreal migrants

Pandion haliaetus (CU 1♂, LA 1♀). Both in January.

Actitis macularia (LC 1♂, CU 4♀, SR 3♀ 1♂). 28 October through 1 January.

Tringa flavipes (OR 2♀, UR 1♂). All 19 September.
Tringa melanoleuca (CU 2♀). 26 October, 22 November.
Tringa solitaria (CU 3♂ 1♀, IN, 1♀, SI 1♀, SR 1♂, UR, 2♀). 3 August through 8 April.
Calidris melanotos (OR 2♂ 11♀, UR 5♂). 4 September through 1 October.
Calidris minutilla (CU 2♀). 7–9 January.
Tryngites subruficollis (OR 5♂ 5♀). 1–14 September.
Coccyzus americanus (UR 1♀). 8 October 1927.
Contopus virens (CU 1♂, OR 1♂, SR 1♂). 19 October through 19 November.
Empidonax traillii (CU 3♂, LA 1♀, SR 5♂ 4♀). 6 November through 19 March.
Tyrannus tyrannus (CU 1♂, SAA 1♂, SR 13♂ 5♀, UR 3♂ 2♀). 13 October through 24 March.
Catharus. None.
Dendroica striata (LC 1♀, CU 3♂ 3♀, IN 1♀). 9 November through 26 January.
Seiurus noveboracensis (CU 1♀ 1?). 10 November and 10 December 1925.
Vireo olivaceus (*olivaceus*, CU 4♂). 8 November through 4 December.
Vireo flavoviridis (IN 1♀, SR 1♂ 3♀). 11 November through 3 December (SR), 27 May (IN).

Austral migrants

Coccyzus melacoryphus (SAB 1♂, SR 1♂, LT 1♂). April, July, November.
Elaenia gigas (SR 1♂, UR 3♂). Dated between 18 September and 21 December 1927, all are in worn plumage with no signs of molt.
Elaenia spectabilis (SAB 1♂). 26 April 1927.
Elaenia strepera (SR 1♀). 13 November 1927.
Tyrannus albogularis (LT 2♂ 2♀, SAA 1♂ 1♀, SAB 3♂). From 18 March through 19 July.
Tyrannus savanna (LT 1♂, OR 1♂, SAA 2♀). 20–22 March, 20 July, 21 November.
Vireo chivi (CU 2♂ 1♀). From 27 October through 19 November.
Sporophila caerulescens (SR 1♂). Testes small. The AMNH also has two specimens from west of Pucallpa collected in 1971.

Scarce and Interesting Species Collected by the Olallas

The following list includes specimens of species now scarce or absent in lowlands of the departments of Loreto or Ucayali. Other species are included to illustrate distributions in this area or the scope of the Olallas' collections.

Crypturellus strigilosus (LA 5♂).
Zebrilus undulatus (CU 1♂ 1♀, OR 1♂, SAA 1♀).
Cochlearius cochlearius (CU 3, AP 1 SA 4, LA 2).
Nycticorax nycticorax (CU 1, SA 3).
Hydranassa caerulea (CU 1).
Jabiru mycteria (SA 1♀). May 1927.
Dendrocygna autumnalis (OR 4, SA 5). No other *Dendrocygna*.
Neochen jubata (LA 1♂).
Cairina moschata (CU 1♂).
Accipiter bicolor (CU 5, SA 1, SR 1). No other *Accipiter*.
Morphnus guianensis (LC 1♀, CU 1♀).
Harpia harpyja (CU 1♂, LA 1♂).
Spizaetus tyrannus (CU 1♂).
Spizaetus ornatus (LC 1♂, CU 1♂, OR 1♂).
Micrastur buckleyi (OR 1♀).
Micrastur ruficollis (SAA 1♂, LA 1♀).
Micrastur semitorquatus (SAC 1♂).
Micrastur gilvicollis (CU 1♂ 2♀, OR 3♂ 2♀, SAA 1♂, LA 1♂).
Micrastur mirandollei. None.
Falco rufigularis (AP 1♂). No other *Falco*.
Crax globulosa (CU 2♀, AP 1♂ 1♀).
Aramides calopterus (CU 1♀, UR 1♂).
Anurolimnas castaneiceps (CU 3♂ 1♀).
Laterallus exilis (*exilis*, CU 1♂ 1♀).
Laterallus fasciatus (*hauxwelli*, CU 1♂ 1♀, SAA 1♀, LA 1♀).
Laterallus melanophaius (*oenops*, SAA 1♂ 1♀).
Himantopus melanurus (OR 1♂ 1♀, UR 1♂ 2♀). These specimens include immatures with white or gray crowns, mottled with black in some. The collar across the back also varies in the degree of black mottling.
Ara couloni (SR 1♀).
Brotogeris sanctithomae (AP 1♀, IN 2♂, LT 2♂ 1♀, SI 3♂ 2♀, OR 2♂ 1♀, SA 7♂ 6♀, SR 4♂ 2♀, UR 2♂ 1♀). This species evidently does not extend far north of the Amazonas.
Touit. None.
Dromococcyx. None.
Neomorphus geoffroyi (*aequatorialis*, LC 1♀). Enlarged ovary.
Neomorphus pucheranii (OR 3♂ 3♀). Including one immature.
Megascops. Olallas collected no *watsonii* and only two *choliba*.
Ciccaba huhula (UR 1♀).
Ciccaba virgata (CU 2♀, OR 1♀, LA 2♂, SR 2♀, UR 1♂ 2♀).
Rhinoptynx clamator (OR 1♂ 2♀).
Nyctibius aethereus (*longicaudatus*, LA 1♀).
Nyctibius bracteatus (AP 1♂).
Nyctiphrynus ocellatus (LA 1♀).
Threnetes leucurus (*rufigastra*, LA 1♂ 1♀). No others collected by the Olallas.
Phaethornis longuemareus (*atrimentalis*, IN 1♀).

Popelairia langsdorfii (*melanosternon*, CU 2♂ 1♀, AP 1♂).
Hylocharis cyanus (*rostrata*, IN 1♂).
Hylocharis sapphirina (CU 1♀, IN 1♂).
Leucippus chlorocercus (CU 2♀, AP 2♀, SAA 1♂).
Notharchus macrorhynchos (*hyperrhynchus*, IN 1♂ 1♀).
Nystalus striolatus (*striolatus*, LT 1♂ 1♀, SI 1♂). None from Peru.
Malacoptila fusca (CU 2♂ 1♀, IN 1♀, LA 3♂ 2♀). All similar.
Malacoptila rufa (CU 2♂, OR 4♀, SAB 2♂, SAD 1♀). All similar.
Micromonacha lanceolata (CU 1♂, AP 1♀, OR 1♂).
Nonnula ruficapilla (*rufipectus* (IN 3♀, SAD 1♀).
Nonnula brunnea (CU 2♀).
Nonnula sclateri (LA 3♂, SR 2♂).
Monasa flavirostris (CU 3♂ 2♀).
Brachygalba lugubris (CU 1♂ 2♀).
Galbula leucogaster (*chalcothorax*, CU 4♂ 2♀, IN 1♀).
Galbula dea. None.
Piculus chrysochloros (*laemostictus*, OR 1♂, LA 1♂, SR 1♂).
Piculus flavigula (*flavigula*, AP 1♂, SAA 1♀).
Piculus rubiginosus and *leucolaemus*. None.
Hylexetastes stresemanni undulatus (SI 3♂ 1♀, LA 1♂). Male from Lagarto is in juvenal plumage.
Philydor rufus (LA 1♂).
Automolus melanopezus (LC 2♀, CU 3♂ 1♀).
Automolus rubiginosus (*brunnescens*, CU 1♀). Resembles 6 specimens from Ecuador.
Xenops tenuirostris (*tenuirostris*, LA 1♀).
Xenops ruficaudus. None.
Xenops rutilans (peruvianus, UR 1♂).
Simoxenops ucayalae (LA 1♂). The type specimen.
Thamnophilus praecox (LC 1♀). The type specimen.
Neoctantes niger (CU 1♂ 1♀, IN 1♀).
Myrmotherula fjeldsaai (CU 1♂).
Myrmoborus leucophrys (LA 1♂ 2♀, SR 5♂ 3♀).
Myrmoborus melanurus (OR 1♀, SAA 1♀, SAD 2♂ 1♀).
Percnostola lophotes (LA 1♀).
Phlegopsis erythroptera (LA 1♂).
Myrmornis torquata (*nobilis*, CU 1♂).
Grallaria dignissima (LC 1♂, CU 1♀).
Hylopezus belepschi (*yessupi*, LA 1♂, SR 3♀).
Hylopezus fulviventris (*fulviventris*, CU 1♂).
Hylopezus macularius (*diversa*, IN 1♂).
Conopophaga peruviana (IN 1♂, LA 7♂ 4♀). The male from IN resembles those from LA. The amount of chestnut-brown on the crown varies.
Schiffornis turdinus (*amazonus*, LC 1♀, LA 1♂). The only specimens of this widespread species in the Olallas' collections.
Hemitriccus iohannis (AP 1♂, SAD 1♂).
Hemitriccus zosterops [*griseipectus*] (*griseipectus*, SI 2♂). None from Peru.
Todirostrum calopterum (*calopterum*, CU 1♂ 2♀).
Todirostrum chrysocrotaphum (*chrysocrotaphum*, SI 1♂ 1♀).
Ramphotrigon fuscicauda (LA 1♀).
Rhynchocyclus olivaceus (*aequinoctialis*, AP 1♂ 1♀).
Tolmomyias sulphurescens (*insignis*, SAD 1♀).
Platyrinchus coronatus (*coronatus*, CU 1♂, SR 2♂).
Platyrinchus platyrhynchos (*senex*, LA 1♂ 1♀, UR 1♀).
Platyrinchus saturatus (IN 1♀).
Myiobius atricaudus (*adjacens*, IN 1♂ 1♀, SAD 1♂ 2♀).
Myiobius barbatus (*amazonicus*, OR 1♂ 1♀, SAD 1?, SR 2♂ 4♀).
Neopipo cinnamonea (*cinnamonea*, SR 1♂).
Muscisaxicola fluviatilis (SR 4♂ 2♀, UR 1♀).
Knipolegus poecilocercus (SAD 1♀).
Myiarchus tuberculifer (*tuberculifer*, CU 2♂, IN 1♂ 1♀, LA 1♂ 1♀). Between 2 January and 16 July.
Tyrannopsis sulphurea (AP 1♀).
Pachyramphus castaneus (*saturatus*, SI 2♂, AP 1♂).
Pachyramphus rufus (LT 1♀, SI 2♀, SAB 1♂).
Microcerculus marginatus (CU 2♂ 1♀, AP 1♀, IN 1♀, LA 1♂ 1♀).
Turdus lawrencii (AP 1♂). The only specimen in the Olallas' collections.
Microbates cinereiventris (*hormotus*, CU 2♀).
Oryzoborus crassirostris (CU 1♂). Testes small, bill mostly dusky.
Caryothraustes [*Parkerthraustes*] *humeralis*. None.
Passerina cyanoides (CU 1♀, AP 1♂, OR 1♀, LA 1♂).
Lamprospiza melanoleuca. None.
Hemithraupis guira (SR 1♂).
Tachyphonus luctuosus (*luctuosus*, CU 3♂, SR 2♀, UR 1♂ 1♀).
Euphonia chlorotica (*taczanowskii*, LT 1♂). No others.
Euphonia chrysopasta, *laniirostris*, *minuta*, *rufiventris*, *xanthogaster*. All well represented from the Napo to the Ucayali.
Cyanerpes cyaneus (*dispar*). None. Bassler collection includes 2 females from Río Mazan.
Coereba flaveola (*dispar*, LA 3♂ 1♀, SR 2♂).
Cyclarhis gujanensis. None.
Vireolanius leucotis. None.
Vireo olivaceus (*solimoensis*, LT 3♂ 1♀, SI 3♂ 1♀, AP 1♂).
Hylophilus thoracicus. None.
Hylophlus hypoxanthus (AP 1♂, SR 1♂).
Psarocolius yuracares (CU 1♂, IN 1♀, OR 2♂ 1♀, SAA 1♀, SAD 2♂ 1♀, SR 1♂, UR 4♂ 2♀).

Now scarce or absent near Indiana and the mouth of the Orosa.

Psarocolius viridis (*flavescens*, CU 1♂ 1♀, OR 2♂ 1♀, SAC 1♀, SAD 1♀, UR 1♂ 5♀).

Agelaius icterocephalus (AP 3♂ 2♀).

Molothrus bonariensis (*riparius*, AP 10♂ 4♀, LA 1♂). The series from Apayacu was taken along with the series of their well-known host *Agelaius icterocephalus*.

CONCLUSION

The evidence reviewed above provides convincing documentation that Alfonso and Ramón Olalla did indeed work at the localities recorded on their specimen labels. Alfonso kept careful notes, provided detailed descriptions of their journeys and camps, and carried on an extensive correspondence with Chapman and other staff at the AMNH, nearly all of which is preserved in the archives of the departments of ornithology and mammalogy. Their specimens, labels, reports, and correspondence provide a coherent picture of their activities. Furthermore, it is now possible, with some recent fieldwork and satellite imagery, to identify the location of each of their camps. The overwhelming majority of the specimens agree with our current understanding of the distributions of birds and mammals in Amazonian Peru. Their collections documented for the first time the limitations of many birds' distributions by major rivers and thus made Chapman and Zimmer aware of the pervasiveness of this distributional pattern in Amazonia.

Nevertheless, there remain a substantial number of specimens that do not agree with our current understanding of bird and mammal distributions in Amazonian Peru. In some cases, errors have resulted from incorrect identification of specimens in New York. Other errors occur among the few specimens acquired from the Olallas by Harvey Bassler in Iquitos and only later transferred to the AMNH. There are also a few recognizably human errors, such as writing the previous year's date in the first week of a new year.

On the other hand, some specimens once thought to be problematic have turned out not to be. In some cases, unexpected distributions suggested by the Ollalas' specimens have been confirmed by recent fieldwork. Furthermore, many of the exceptional specimens fall into patterns that suggest new insights into the distribution of birds in northeastern Amazonia. For instance, the upper Ucayali appears to be a less consistent limitation for the distributions of birds than the Amazon itself. In addition, some birds characteristic of the Andean foothills appear to occur sparsely in hilly terrain hundreds of kilometers from the Andes. Overall, the Ollalas' collection of over 7000 specimens of birds from 10 localities in Amazonian Peru has provided the basis for understanding one of the world's most diverse avifaunas. It also poses some questions for the future.

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